

AUG 3 1923

Shaft-Sinking Operations at New Gallup American Mine, pp. 165-170

COAL AGE

McGraw-Hill Co., Inc.

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August 2, 1923

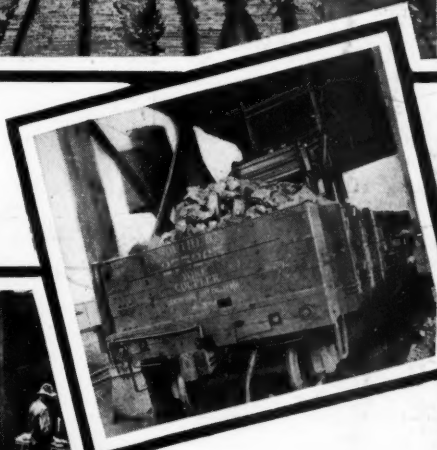


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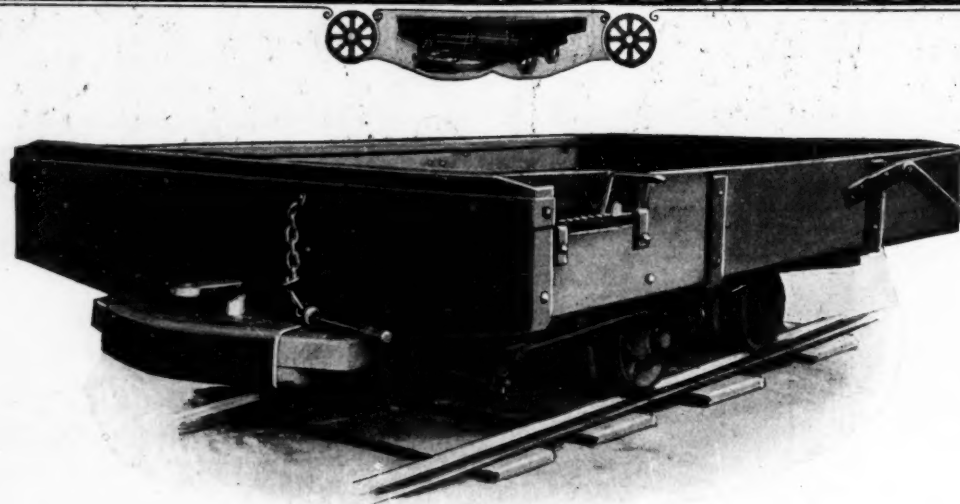
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C. E. LESHER, *Editor*

Volume 24

NEW YORK, AUG. 2, 1923

Number 5

The Check Off as an Issue

IT WOULD have been surprising if the bituminous coal operators had left unchallenged the assertion of John L. Lewis to the anthracite operators that the "check off" had been working for years in the soft-coal fields to the mutual satisfaction of both parties. The statement issued last Saturday by the National Coal Association covers the situation. The check off, however it may have come into being, and whatever its virtues originally as a source of strength to a growing organization of mine workers seeking to stabilize the industry in which they worked, has of late years fallen into disrepute.

The method by which the union forces allegiance and payments of assessments and dues, unique as it is in industrial relations, has not itself been held to be illegal, at least by high courts. But the use to which it is put has been vigorously condemned, and it is a practice now closely bound into the relations with the United Mine Workers and one of which a great many, if not all the organized soft-coal operators would heartily like to be purged. To hold as an argument, as have the committee for the anthracite workers in the recently disrupted negotiations at Atlantic City, that for the hard-coal operators to concede the check off would be to enable the union to better hold the men in line, prevent petty strikes and otherwise benefit the industry, in the face of the record of local strikes and disrupting practices in the oldest organized soft-coal fields of the country, where the check off has been in effect for a quarter of a century, is to strain one's credulity.

Since it is the issue of the check off that is threatening to shut off anthracite production on Sept. 1, the public will seek to learn what the Coal Commission has to say on that point. It will look in vain, however, in the commission's anthracite report of last month for word about the check off. It is not mentioned. There are eight recommendations covering the matter of preserving peace in the hard-coal fields, of preventing and forestalling friction and promoting harmony. That would seem to be its answer to the miners, who say that without the check off they cannot keep the men under control.

It were well to recognize the check off for what it is—a means of financing the United Mine Workers. If they hold above all other demands the need for a forced draft of funds from the men, if they place, as they seem to have done, the demand for the check off above that for corrections in working conditions and higher wage rates, then they are saying that Indianapolis rather than the mine worker requires more money. It is quite generally known that dues are difficult to collect when the payment is voluntary. There are two ways to collect union dues—one to enlist the man's enthusiasm and support so that the money is gladly

given in support of the cause; the other to force the operators to collect it, even if in the process the country is deprived of coal at the beginning of winter.

It is all very well to say that the miners execute individual assignments permitting the company to subtract the moneys from their pay. The practical effect, as every soft-coal operator who collects the check off knows, is to force the men to the agreement. The union furnishes the duress. There are no exceptions; the result is the "full union recognition" desired by Mr. Lewis, and every pay check gives up its toll to the union treasury, in a way and to a degree that does not now obtain in the hard-coal region.

Quid Pro Quo

SECRETARY of the Interior Work will be greeted on his return from Alaska with the compliments of the engineers of the country. He may be somewhat surprised to learn that his summary dismissal of A. P. Davis from the directorship of the Reclamation Service is considered by the profession in which Mr. Davis stands so high to be nothing short of an endeavor to obtain a partisan political advantage. That is to say, the new Secretary of the Interior, who has established national fame for his successful conduct of an asylum for mental diseases, is credited with playing the political spoilsman with the Reclamation Service. The federal government has a net investment of \$132,000,000 in reclamation projects, \$8,000,000 is invested annually in new projects and there is an annual turnover of some \$4,000,000 in the maintenance fund. No less than 100,000 voters in the West, where votes are few, are directly interested in these projects.

Arthur P. Davis was fired after many years of valuable work in building up and protecting this vast and widespread enterprise of our government. He was fired because he would not resign. It is understood that he steadfastly stood in the path of those in the administration who would forget the debts—for votes—of those who owed money on their water rights.

Ex-Governor Davis of Idaho, who now takes administrative charge of the Reclamation Service, is admittedly a practical professional politician—one who, it is reported wanted the secretaryship now occupied by Mr. Work.

Secretary Work's explanation is an insult to the engineering profession. He wants a business man at the head of this bureau! The man he selected succeeded in the grocery business, but his subsequent banking experience was not so successful!

In the Interior Department, which Mr. Work now heads, are other technical bureaus—the Geological Survey and Bureau of Mines in particular. Will he seek business heads for these as well, or are there not sufficient votes appended to these activities?

Selfish Unselfishness

IF HERBERT HOOVER, Secretary of Commerce, were called upon to compress into two words the idea behind "good" trade associations, he might call it selfish unselfishness. In the book on associations which his department recently issued Mr. Hoover makes another effort to drill home the convincing thought that business can be of greatest service to itself by being of greatest service to the public. Accurate compilation and distribution of business statistics on coal, for instance, are essential if the people of this country ever are to understand coal and get the correct mental attitude toward the industry. In no better way can "coal baronism" be expunged from the nation's mind.

No other agency can do it so well as the trade association, Mr. Hoover believes. So the association is the industry's best weapon for defence. Therein lies its selfishness. But the association must be sound in principle and practice from core to surface. The only way to make its statistics constructive is to conduct it "alike for the benefit of producer and consumer." Therein lies its unselfishness.

Such associations we must have, Mr. Hoover thinks, because every industry needs adequate statistical services both for the direction of those within the industry and for the information and understanding of those outside it. There is a point to Mr. Hoover's sentence: "Whether these services are to be maintained by the government or by trade associations, they must be maintained if we are to have an orderly economic life." It is useless to try to decide whether Mr. Hoover means this as a threat. It is not his habit idly to toss threats about. He does habitually devote a master intelligence, though, to problems confronting all American business, and it is evident that he is going to do everything he can to see that this country has "an orderly economic life."

Brain and Brawn

EDMUND HENRIQUES, coal miner at the Gates mine of the H. C. Frick Coke Co., has chosen to sell his brawn rather than his brain, though apparently he does not lack the latter. During the World War Henriques served in the British Royal Air Service as a flyer. For bravery and daring, and for skill doubtless also—bear that duly in mind—he was cited by his superiors.

He is in America digging coal for the public, a job "affected with public interest," and he seems to be doing quite well. The other day he purchased an airplane in New York, rose in the air and flew in five hours to Gates. In the evening after his day's work is done he is said to disport himself with nose dives, tail spins and the like.

The question naturally arises, Is he worthy of the earnings of \$300 to \$350 a month which he is said to be receiving? Is he entitled to have a wage that will enable him to buy and operate an airplane? Is the miner in West Virginia, of whom we have heard, whose wife meets him every night in a Packard getting too big a wage? We do not know. We might if wages in coal mining were left entirely to supply and demand.

The time may come in America when brawn may compete on even terms with brain, especially with the more mediocre kinds of the latter. Certain it is that some people believe that the time already has come. Some say brawn is in the ascendant and prove it by

alleging that those who merely think and plan and do not exercise their muscle obtain less for their work than those who when they exercise their brains do so only in the direction of their own physical efforts.

Unrestricted competition might settle that question, but we do not find it operative any more, for the payment for labor in union mines is kept at a high level by combinations and that at non-union mines may be boosted for all we know by the fear of such conspiracies, whereas brain labor is not thus sustained. Perhaps that is why mine foremen, surveyors, mine clerks, and even superintendents often fail to get wages equal to those paid physical laborers. But then again that may not be the reason. We do not know.

Still it cannot be denied that men who do not disdain hard and dirty labor and who dispense with the dignity of the office man and official yearly are gaining on the lower grades of brain workers. It is getting more and more customary for men to seek the softer jobs, and the market is accordingly overstocked. The sons of miners hunt less arduous occupations than their parents, as more desirable, even if less remunerative.

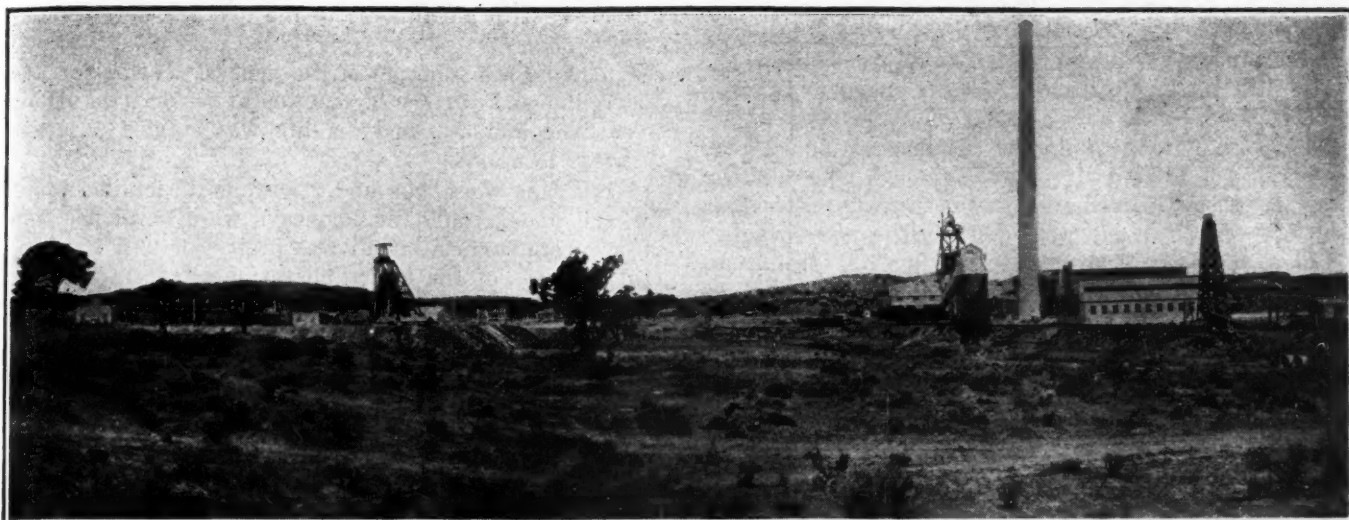
Say what we will, our ancestors did not find personal toil either derogatory or displeasing. They were inured to hard labor and respected those who were willing as they were to perform it. Because the brain worker has set himself apart does not by that fact entitle him to bigger pay. Direction of the services of others is not necessarily more valuable than the performance of the services themselves. So we cannot feel assured that Henriques has not a right to his evening spin or the man in West Virginia to come to, and leave, his work at the wheel of his Packard.

But at the same time we cannot be sure whether this is so till all men come into an open market to find the true value of their services and learn by unrestricted competition how greatly the country needs their particular class of effort, and how many are able and willing to perform it.

With common-school education what it is, with higher education so cheap, everyone can perform certain of the labors which we class as brainwork jobs, but since man first rose above the animals there have been occupations that needed veritable genius. The men performing such jobs always will be paid more than those who employ themselves at work which demands many foot-pounds of energy and but little skill for its accomplishment.

Meantime, Henriques, so long as your flights leave you with a whole skin, you will as a flyer and a worker typify the new world into which we are about to enter and perhaps have already attained.

SPEED WOULD SETTLE MANY A COAL DISPUTE. But how can a dispute over the quality of a car of coal be settled quickly if the matter goes to a court of law? The car cannot stand on a siding for ninety days rolling up demurrage while some court gets around to it on a crowded calendar. But one or more coal men could hasten out and see that car of coal on a day's notice, or less. Right there is a strong argument for writing an arbitration clause into every coal contract. With such speed possible, an improper or unfair complaint against a shipment of coal would be strictly out of luck. Also, an unprincipled shipper would have a hard time palming off fireproof fuel or anything else that did not appear to be up to the specifications. There would be more justice in coal trading.



Surface Plant, Gallup American Mine, Navajo No. 5

Gallup American Coal Co. Displaces Four Long Slopes With One Ultra-Modern 5,000-Ton Shaft Mine*

Navajo No. 5 Is Sunk in Broad New Mexican Tract to Increase Economy and Output—Main Shaft Equipped with Skip—Other Shaft with Cage, so That Two Seams Can Be Served

BY H. B. COOLEY†

INTEREST has centered lately upon the property of the Gallup American Coal Co., near Gallup, N. M., where a pair of deep shafts tapping a low point of a large coal acreage are displacing four slopes the length of which has reached the "economic limit." New, big-scale underground development, a skip hoist and a noteworthy surface plant are combining to consolidate the scattered slope units into one economical and thoroughly modern 5,000-ton mine—Navajo No. 5. Three coal camps also are being merged into one mining town.

The Gallup American Coal Co. is owned by three of the large copper companies of the Southwest, and the output from the mines of this company insures to its owners and other mining and metallurgical plants in Arizona and New Mexico an adequate supply of fine coal for their power plants and smelters. One-inch screens ordinarily are used to separate the commercial from the "company" coal. Everything that passes over these screens is sold by the coal company through commercial channels.

The Santa Fé railroad uses 1x4-in. egg coal for several divisions of its Southwestern territory, and this size is demanded by some of the mining companies. Domestic grades, especially "Gallup lump," are in large demand throughout the Southwest. Gallup coal is sold as far north as Albuquerque, N. M., east through the Pecos Valley to Amarillo, Texas, south to El Paso, in the same state, and west to Los Angeles and San Francisco.

The Gallup coal field, on the main transcontinental line of the Santa Fé railroad, is the most promising source of fuel throughout a vast territory in the south-

western portion of the United States. The location and extent of this coal field are shown by Fig. 1, from which it can be seen that the Gallup American properties are in the heart of the Gallup field, that company holding extensive coal and surface rights. It is expected eventually to develop 3,000 acres of coal property, all containing two workable seams, from one centrally located mining operation.

Thus far practically all of the developments in this territory have been by means of slopes. Coal has been mined in that way in this field for over 35 years, the most extensive work having been done by the Victor American Fuel Co. That firm had four operations working before the war, and on July 1, 1917, these plants together with all coal and surface rights were acquired by the Gallup American Coal Co.

The mining plants which the present owners have continued to work since 1917 are known as the Weaver Slope, Navajo Slopes Nos. 1 and 2, and the Heaton Slope. Their location with respect to each other and to the new mining operations are shown on the general map (Fig. 2).

As can be seen by referring to this map the slope operations have all been carried to what might be called the economic limit. Foreseeing this fact the present owners several years ago began prospecting for a more suitable location for further developments, and drilling was started to establish the extent and character of the coal underlying their undeveloped property.

The general map—Fig. 2—shows how thoroughly this territory was drilled. After a study of the data obtained from these drillholes it was decided that a shaft should be sunk in what had been proved to be the "basin" of the coal area.

In the meantime several conditions at the old plants began to make the need for this new development more apparent. First, the coal available from the Heaton

*This is the first of three articles on Navajo No. 5 mine. The second article, covering the underground workings and bottom plan, the skip hoist, the auxiliary hoist and the tipples, will appear soon. The third will cover power plant, water supply and other interesting features.

†General superintendent, Allen & Garcia Co., Chicago, Ill.

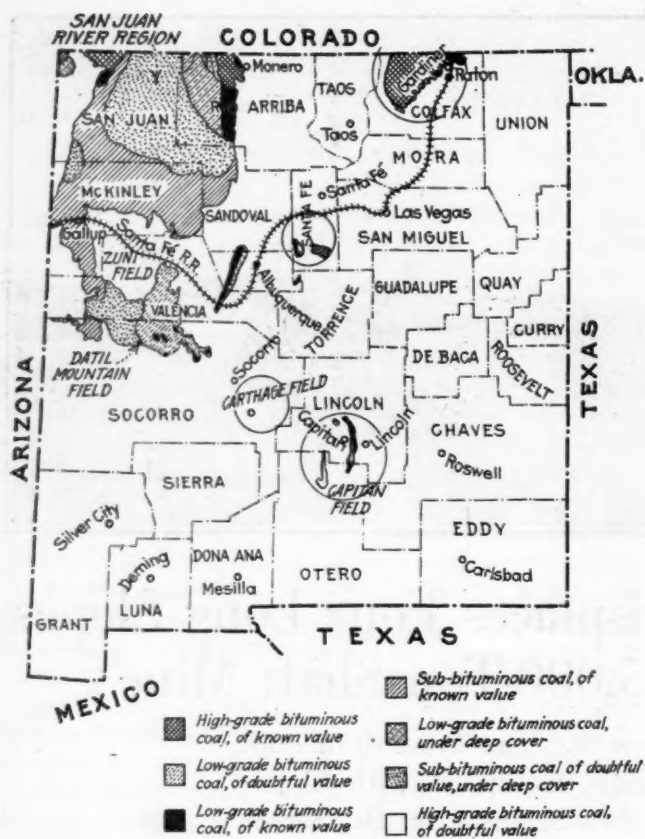


FIG. 1—COAL-RESOURCE MAP OF NEW MEXICO SHOWING LOCATION OF GALLUP FIELD

Gallup lies in the San Juan River region. The coal is sub-bituminous; that at Raton is bituminous. In the Cerillos field some anthracite coal is found in connection with an intrusion of diorite. The nearness of the Gallup field to Arizona is deceptive, the connection with the copper fields unfortunately being somewhat indirect.

Slope was nearing exhaustion. Mining costs at this operation were not excessive, but it was impossible to obtain additional coal rights adjacent to the mine workings. Second, with the increased length of the Weaver and Navajo slopes, the cost of the coal from those mines was rising rapidly, not only by reason of the longer haul but also because the fires in the coal measures above the workable seam, which were difficult to control, rapidly increased the costs of maintaining the slopes, for the heavy ground could be restrained by timbering only with difficulty. Third, the demand for coal began to exceed the maximum production of these properties under the unfavorable conditions with which they then were confronted.

With these factors facing them the owners on July 1, 1920, decided to build a complete new mining plant and the Allen & Garcia Co., Chicago, were selected as engineers and directed to prepare plans for the entire operation. Previous to this time the data obtained from the diamond drillholes had been thoroughly correlated and an accurate contour map of the company property completed.

With this information as a guide, preliminary top and bottom plans were prepared and an effort was made to fit the two sets of plans together in such manner as to obtain the best possible arrangement for both. Underground conditions seemed to favor a main haulageway running approximately north and south. Overground conditions favored a track layout at an angle from that line. The result was that the two main axes of the entire layout lacked 17 deg. of being at right angles with each other. Although at first this feature seemed somewhat of a hardship, it proved

to have several advantages in the detailed development of the plans.

Following the adoption of the general scheme for underground and surface layout, tentative shaft locations were fixed and diamond drilling was started adjacent to these locations.

While this work was under way more detailed plans for the underground haulageways were developed and an accurate surface layout was prepared. All the general features of the entire operation affecting the size of the shafts were decided upon as quickly as possible and the shaft plans were completed and material was on the ground ready to start sinking by the time the drillholes at the shafts were finished. The actual shaft sinking was started Sept. 1, 1920. With this under way plenty of time was available for the completion of detailed plans for the rest of the work.

The determination of the proper size and arrangement for the two shafts involved the consideration of many features. The dimensions for a shaft of this depth should be kept as small as possible without undue limitations being placed on the hoisting capacity or on operating convenience and economy.

To warrant a money investment of the size required to develop this property an ultimate capacity of 5,000 tons per day upward must be anticipated.

If self-dumping cages are to be used for getting this output the hoist cycle must necessarily be fixed by the mine-car capacity. With a coal seam the thickness of which seldom exceeds 5 ft. 6 in., a mine car holding more than three tons is impractical, and thus the coal hoisted per trip with a single-deck cage is limited to that quantity. To get a capacity of 5,000 tons per day,

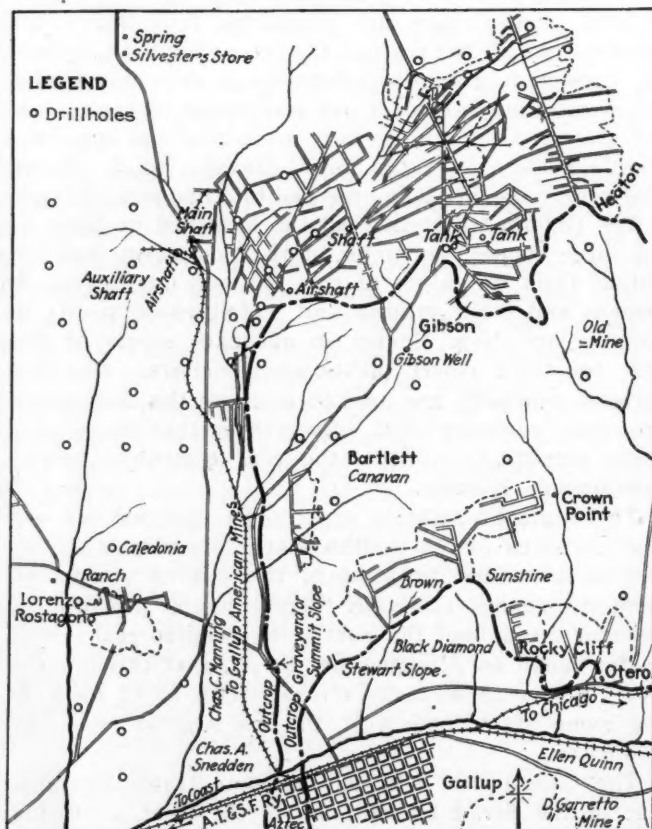


FIG. 2—GALLUP AND ITS NEARBY COAL WORKINGS

The coal fields around Gallup are no longer of unproved value. The network of headings in two of the seams is evidence of that fact. However, the Gallup American Coal Co. has most diligently and methodically proved its property as to coal depth and coal thickness by riddling the proposed seat of operation with drillholes, numbers of which may be noted in this illustration.

hoisting three tons at a time, is manifestly impossible, especially when, as in this case, the total lift exceeds 850 ft.

To use double-deck cages involves many difficulties, such as an expensive car-handling arrangement at the shaft bottom and a breakage of coal in dumping at the top. It was necessary to avoid such breakage in the case of Navajo No. 5. Tandem-deck cages, hoisting two cars simultaneously, were considered, but the idea was abandoned on account of the necessarily tremendous increase in size and cost of the shaft.

The use of skips for hoisting presents a solution for all these difficulties and has many other advantages over all other methods hitherto devised for handling large coal capacities through a single shaft. In consequence, decision was made in favor of the use of skips at the main shaft.

The arrangement at the auxiliary or air shaft was next considered. As has been mentioned, there are two workable seams available throughout most of the area adjacent to the site of the shafts. For the working of the second seam the most feasible plan seemed to be to put a cage hoist in this shaft.

Most modern mines are provided with an independent hoistway of some kind for lowering men and material into the mine. This problem has become more acute at the large-capacity operations where the number of men in the mine often reaches 800 or 1,000 per shift. As from 10 to 20 per cent of the material hoisted at

Gallup is rock, its disposal also presented a serious problem. These considerations all seemed to dictate the installation of cages at the auxiliary shaft with an air compartment for ventilation.

The type of shaft lining to be used was not fully determined even after the diamond-drill cores were available, and it was not until the shaft had been carried to considerable depths that a reinforced-concrete lining was selected. The drillhole logs show nothing to indicate difficulties in sinking, but it was only by skillful work that the heavy ground was held until the concrete lining could be placed.

All the officials in charge of the sinking operation were men experienced in metal-mine shaftwork, and most of the sinkers were Arizona "hard-rock" men of the type notorious not alone for the speed with which they can "punch down a hole" but also for some other stalwart abilities.

The main, or skip-hoisting, shaft is 785 ft. deep from the landing at the surface to the top of the rail in the haulage entries underground with an additional 43 ft. below this point to the bottom, for the skip lands its timbers in the sump. The inside dimensions are 9 ft. x 20 ft. 7½ in., the shaft having three compartments separated by two rows of buntons.

Two of these compartments are used for the skipways, each 6 ft. 5½ in. between guides. The third compartment contains a steel escapement stairway 2 ft. wide, and set on a 45-deg. angle. The stairway is

Drill Hole No. 130

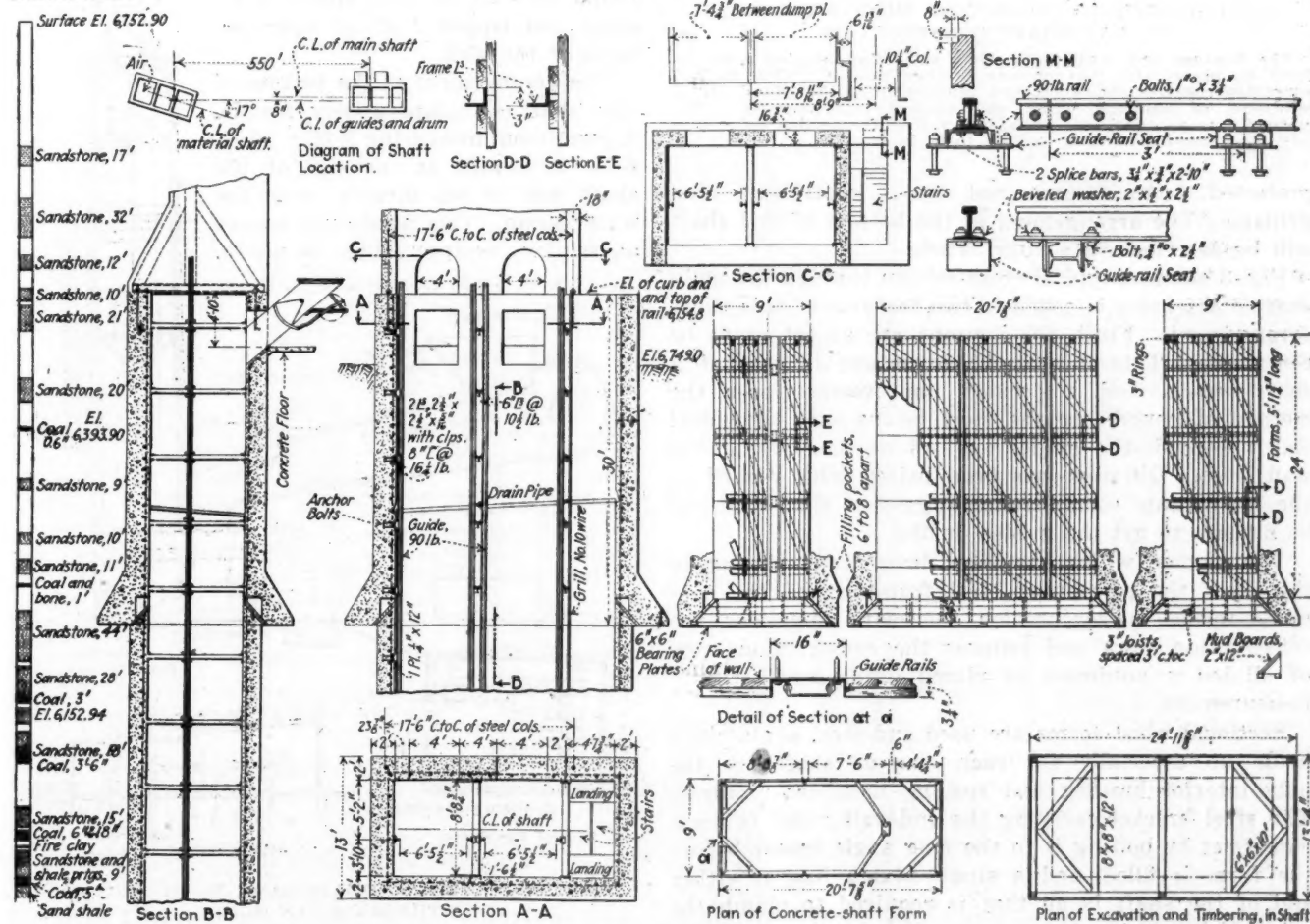


FIG. 3—CONSTRUCTION PLAN OF THE MAIN SHAFT WITH DETAILS OF GUIDES, BUNTONS AND CONCRETE FORMS

The main shaft has two skip compartments, each measuring 7 ft. 4 in. from buntun to buntun or from wall to buntun as the case may be and being 9 ft. wide from wall to wall. It also has a stairway. The guides, it will be seen, are set 8 in. to one side

of the center line of the shaft for the purpose of accommodating the skip. The buntuns are set so that they can be removed, which is of advantage in case of a shaft wreck. The guides are set on brackets at the wall lines.

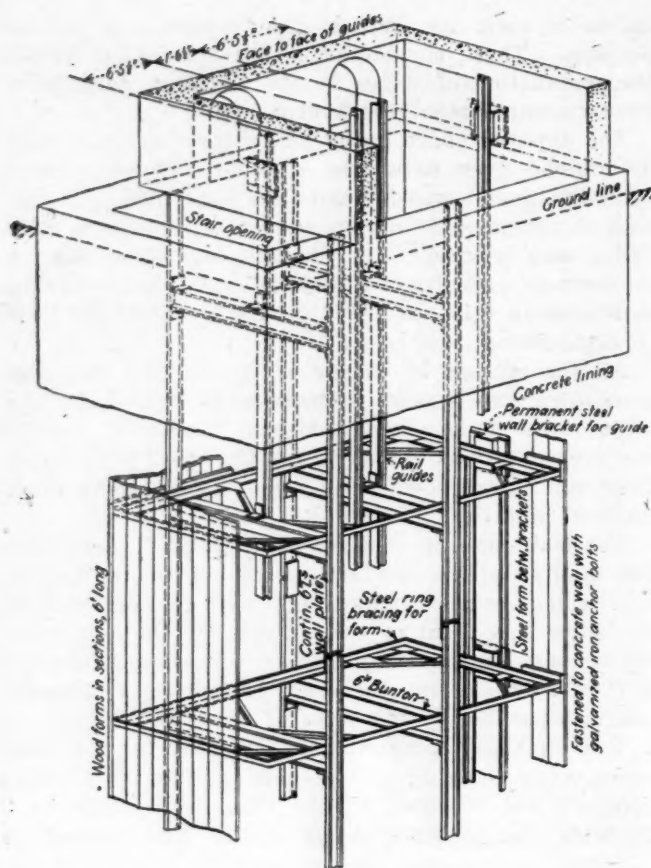


FIG. 4—ISOMETRIC PROJECTION SHOWING DETAILS OF MAINSHAFT CONSTRUCTION

The buntons and wall plates with steel ring bracing hold the form in place, and the concrete is then poured. This method simplifies construction work and relieves the crew of all but a minimum of plummet lining and accurate measurement. The method was so exact and satisfactory that the guides did not in any place need shimming to hold them in line.

protected from falling coal by a continuous iron grillage. The arrangement at the bottom of this shaft will be described in a later article.

Fig. 3 shows a typical cross-section through the main shaft. Attention is called to two features of this shaft arrangement. First, the buntons are so set as to be removable. This is a great advantage in case of a shaft wreck, and a decided improvement over the method of concreting the steel beams into the shaft wall. Second, the guides are set on brackets at the wall lines. Question has been raised with regard to the innovation, some having suggested that it would be difficult to get the guides in line.

The method which has been devised for placing in the shaft the permanent steel framing and the concrete forms in conjunction therewith simplifies the construction work and relieves the construction crew of all but a minimum of plumb lining and accurate measurement.

Sectional wood forms are used and steel angle rings made up especially for each size of shaft are the only interior bracing and spacing members required. The steel bracket carrying the end-wall guide is accurately set by bolting it to the ring angle spacer before the form is filled, and a single plumb line at either end of the shaft is all that is required to plumb the sets which hold the forms.

The permanent steel wall plate, buntons and guide brackets are all set before the form is poured and the chances for misalignment are reduced to a minimum. The steel guides in this entire shaft were set without

a single instance of shimming and throughout the entire shaft the variation of execution from design is not more than $\frac{1}{4}$ -in. Fig. 4 shows an isometric view of the method of construction described.

The auxiliary shaft (Fig. 6) is of the same general type of construction as the main shaft. It is 780 ft. deep from surface to bottom landing, with an additional depth of 16 ft. for a 12,000-gal. water sump at the side of the shaft. The inside dimensions of this shaft are 10 ft. 6 in. x 25 ft. 3 in., the shaft being divided at about the $\frac{1}{3}$ points by a 9-in. concrete partition wall and a steel buntun respectively.

This partition wall permits the use of this shaft for both downcast and upcast air, the primary air compartment being 95 sq.ft. in area. The other two compartments of the shaft are given over to two cageways, the cage platform being 10 ft. long with 6 ft. 3 in. between guides.

The horizontal reinforcement of this shaft is by $\frac{1}{4}$ -in. round bars. At the sides these are 18 ft. 6 in. and 10 ft. 6 in. long, lapped 2 ft., and set on 9-in. centers. At the ends they are 12 ft. 6 in. long and spaced at 12-in. intervals on alternate faces of the wall. This refers to the main part of the shaft. At the top the horizontal side reinforcement is 11 ft. and 19 ft. long lapped 2 ft. and set at $7\frac{1}{2}$ -in. centers. The horizontal end reinforcement is 13 ft. 6 in. long and set also at $7\frac{1}{2}$ -in. centers. The partition-wall reinforcement is 13 ft. 6 in. long and spaced at 12-in. intervals. All the vertical reinforcement is of $\frac{1}{4}$ -in. round bars 14 ft. long spaced 2 ft. apart and lapped 2 ft. on alternate faces of the wall.

The arrangement at the bottom of this shaft is comparatively simple. A pumproom measuring 9 ft. x 10 ft. 6 in. is located at one side of the shaft and is set directly over the water sump. This pumproom houses a triplex reciprocating $5\frac{1}{2}$ x 8-in.

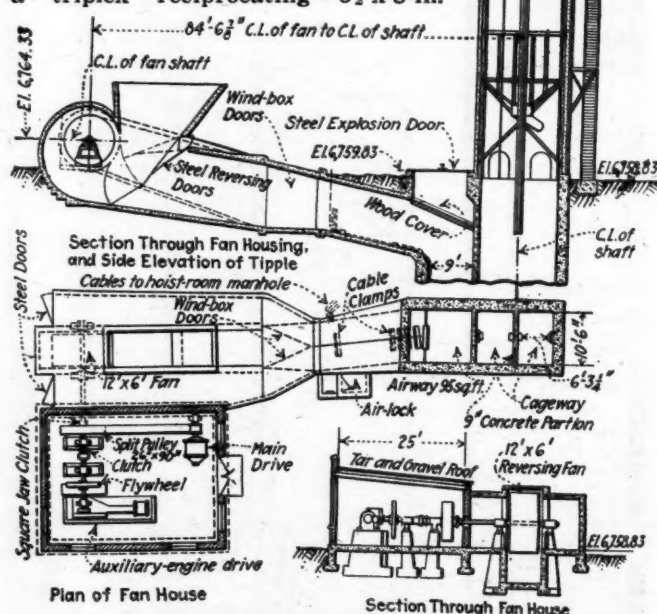


FIG. 5—MATERIAL HEADFRAME WITH SECTIONS THROUGH FAN HOUSE

The shaft to which these structures pertain has cages instead of a skip. The airway is 9 ft. x 10 ft. 6 in., giving a cross sectional area of 95 sq.ft. Immediately above it are a wood cover to relieve the pressure in case of an explosion and steel explosion doors which when blown open can be replaced immediately. The fan is fitted for reversing the air and arrangements are made by which electric drive can, when desired, be replaced by a direct engine drive through a cut-off clutch.

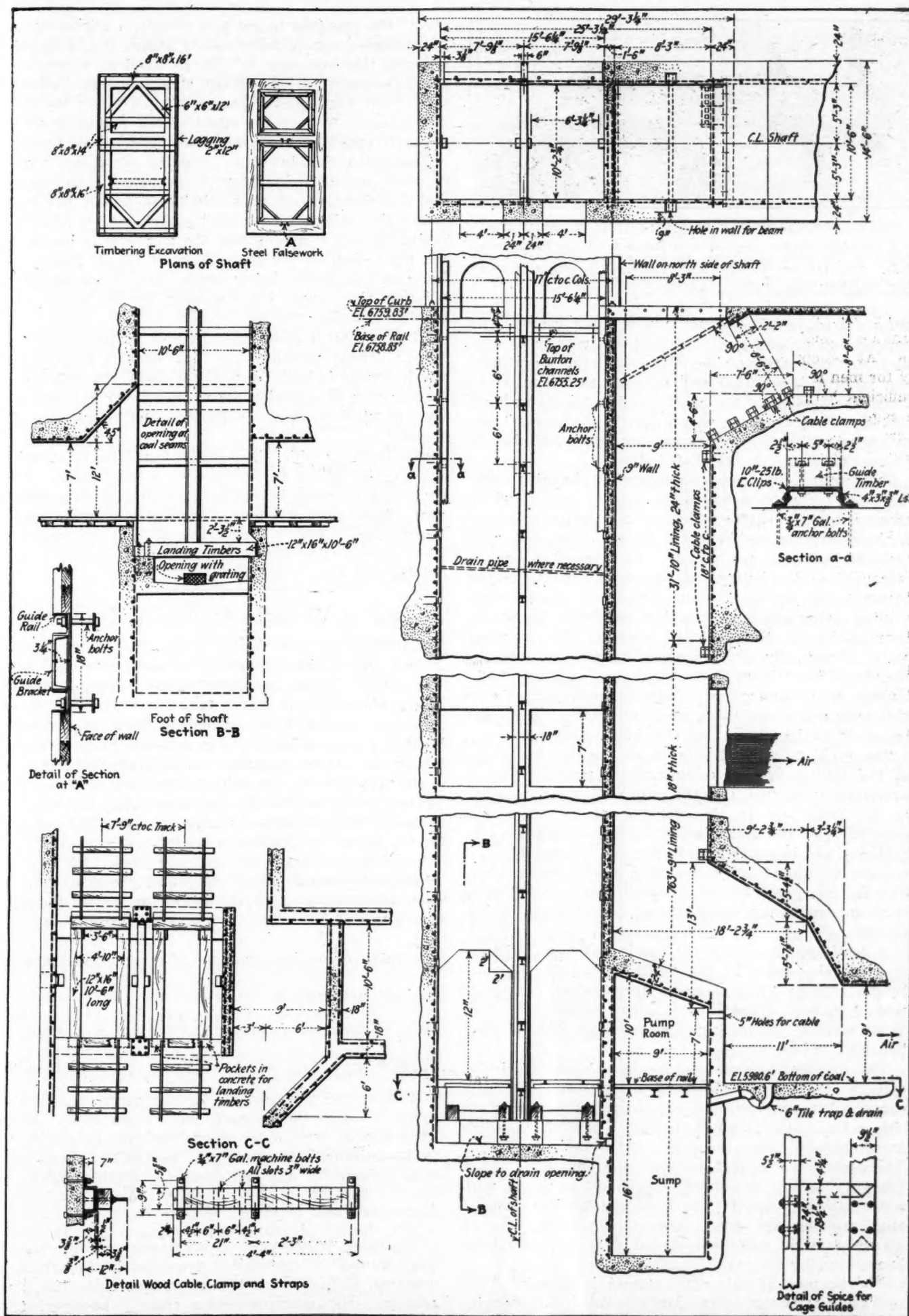


FIG. 6—CROSS-SECTIONS AND DETAILS OF MAN-AND-MATERIAL SHAFT SHOWING BOTH COMPLETED AND FALSE WORK

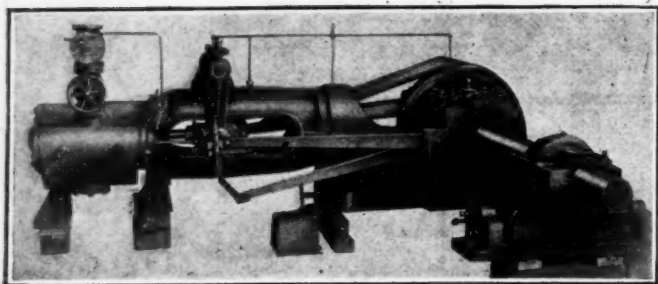


FIG. 7—AUXILIARY FAN ENGINE PRIOR TO MOUNTING

A 14x24-in. engine supplied with steam from the boiler house takes up the work of driving the fan whenever the electricity fails. This fan has no governor. The speed is regulated solely by varying the cut-off, a much more economical plan than throttling down the steam with a governor.

pump driven by a 35-hp. motor, which is run about two hours a day and can easily dewater the sump in 45 minutes. At the opposite side of the shaft the usual pass-way for men is provided and the entry roof is raised to a sufficient height at the shaft to allow taking rails off the cage. All openings within 50 ft. of the shaft are concrete-lined, and every precaution has been taken to prevent a squeeze on the shaft bottom.

Practically no water is encountered in the mine workings and the only water to be pumped is that which escapes into the shafts. Most of this water occurs in a shale stratum at about the 300-ft. level and runs from 25 to 30 gal. per minute. At present this water is caught at the bottom of the shaft and is pumped thence to the surface. Plans are being made for installing a ring and pump chamber just below the water-bearing strata, thus greatly lowering the pumping costs. Practically all this water will be required for the use of the miners in the bathhouse and for miscellaneous surface purposes. There is not sufficient surplus over and above these needs to justify an attempt to use it in the power plant for boiler-feed water.

The problem of ventilation in all the existing mines of the Gallup field is comparatively simple. Gas is practically unknown, and the only ventilation required is for fresh air in the working places. The fan selected is of the undershot type; it normally runs as a blower and is guaranteed to furnish 300,000 cu.ft. of air per minute at 200 r.p.m. with a 4-in. water gage. The fan shaft is arranged primarily for a motor drive with an emergency steam-engine drive through a jaw clutch.

A brief specification of the fan is as follows: Diameter of fan wheel, 12 ft.; width, 6 ft.; 36 variable-length blades; 9-in. diameter forged-steel fan shaft turned to 8-in. diameter throughout the driving end. Total weight, including reversing doors but no steel housing, 56,000 lb.

The emergency steam engine is a 14x24-in. single-cylinder unit of the piston-valve type, and is direct-connected to the stub shaft of the fan. This stub shaft drives the main fan shaft through a jaw clutch which is disengaged when the motor drive is in operation. The engine is arranged with a hand adjustable cutoff for varying the speed and is not equipped with a throttling governor. A Falls automatic overspeed stop provides for any overspeed emergency that a governor might take care of, but does not control the engine during its normal running.

The purpose of this arrangement is to require the operating attendant to regulate the speed of the engine by varying the cutoff. This means a greater steam economy than with the ordinary method of "throttling

down" the governor to get a variation in engine speed. A pressure-reducing valve taking steam at 175 lb. and reducing the pressure to 125 lb. insures a constant steam pressure at all times, which in turn insures a uniform fan speed. The only time when there is any occasion to vary the speed of the engine is when the mine requirements demand an increased air volume.

The entire fan housing, including scroll and évasé chimney, is built of reinforced concrete. Maintenance and deterioration are thus eliminated and it has been found that when the fan is installed with a concrete casing instead of one of steel the total cost is increased not more than 20 per cent. The air tunnel leading to the shaft is partly below grade, and doors are provided in this tunnel for reversing the air should this ever be desired.

Steel explosion doors are provided at the top of the shaft. These normally are left open. An airtight wooden cover is built below these doors, the idea being that in case of explosion the wooden cover is blown out but the steel doors are unharmed and readily can be closed.

The building which houses the fan drive is of brick construction 25x34 ft. inside, with a 3-in. wooden roof supported on steel beams and carrying a composition roof. Steel sash and $\frac{1}{4}$ -in. ribbed glass provide ample illumination. Fig. 5 shows the general arrangement of the fan setting and Fig. 7 is a view of the engine driving the fan.

Law of Mixtures Applies to Volumes

PROFESSOR J. W. WHITAKER, of University College, Nottingham, England, in correspondence with Kenneth D. Dodds, instructor in metallurgy, School of Mines, University of Pittsburgh, draws attention to an oversight in his article entitled "How to Calculate Washed Coal and Refuse from Ash and Sulphur Determinations," which appeared in *Coal Age*, April 19.

He says that the law of mixtures cannot be applied to the specific gravity of a mixture unless the volumes of the constituent bodies be taken instead of the weights. He illustrates the distinction as follows:

"Consider mixtures of coal and shale, the specific gravity of the coal being 1.25 and of the shale 2.5. If equal *weights* are mixed, the specific gravity of the mixture is not $(1.25 + 2.5) \div 2 = 1.875$, for this reason:

A gram of coal has a volume of $\frac{1}{1.25}$ c.c., and a gram of shale, a volume of $\frac{1}{2.5}$ c.c.

Hence 2 grams of the mixture have a volume of

$\left(\frac{1}{1.25} + \frac{1}{2.5}\right)$ or $\frac{3}{2.5}$ c.c., and 1 gram of the mixture has

a volume of three-fifths of a cubic centimeter. Hence 1 c.c. of the mixture has a mass of $5 \div 3$ or 1.667 grams, or in other words, the specific gravity of 50:50 mixture (by weights) is 1.667. If we mix equal *volumes* of coal and shale, the specific gravity of

the mixture will be $\frac{1.25 + 2.5}{2} = 1.875$."

Professor Whitaker's criticism was not directed at the argument or conclusions presented in the article in question, and in fact it applies to a parenthetical illustration. His example shows clearly, however, that volumes must be considered when calculating specific gravities of mixtures.

Thin Layer of Coal Charred at a Low Heat on Traveling Platform of Hot Metal Plates, Saving Byproducts*

Low Heat Conductivity of Coal at Low Temperatures Makes Distillation Slow and Expensive—Difficult to Spread Thin Layers of "Molten" Coal and Prevent Carbonization on Oven Walls—How New System Meets These Problems

By R. D. LAMIE

Huntington Coal Distillation Co., Huntington, W. Va.

IN THE familiar byproduct oven coal is coked at a relatively high temperature, with the consequent production of hard metallurgical coke and the condensation of the tars, light oils and ammonia and the utilization of non-condensable gases, the major idea being the production of hard coke for blast furnaces, and the obtaining of byproducts being a matter of only secondary consideration. However, this form of utilization is not without its limitations because of the restricted and specialized use of its main product—coke.

Hard metallurgical coke does not make a satisfactory domestic fuel and has little or no use for power purposes, two important fields. The problem, therefore, becomes one of supplying these markets with a satisfactory fuel, at the same time recovering the byproducts.

For a long time the possibilities in this field have been given intermittent attention, but work has been particularly active in this country since 1913, when Parr and Olin published the results of their investigations into the low-temperature distillation of coal.

They and subsequent workers were able to show that if high-volatile coal was coked at moderately low temperatures—1,000 to 1,200 deg. F.—the resulting products were of an entirely different character from those produced in the familiar byproduct oven. The coke obtained was light and porous, and had practically no structural strength; in fact it is not coke, as we ordinarily understand it but a product midway between coke and coal, as it still retains a part of its volatile matter.

The most notable difference, however, was in the yield of byproducts, the quantity of tar being about three times as much as by the older process, and the non-condensable gases, though smaller in volume, are much higher in heat units.

TAR THIN AND BETTER SUITED FOR MOTOR USE

Further, the character of the tar was different. It is much thinner and contains a larger percentage of low-boiling constituents. The creosote fraction is larger. The higher boiling fraction does not contain naphthalene, and the percentage of pitch is less. In fact it more nearly resembles crude oil than the older high-temperature process tar.

With this knowledge came the realization that with a practical method for the handling of the process an entirely new field of usefulness was opened for high-volatile coal. The semi-coke could be adapted to domestic and industrial purposes; the tar could be refined into motor spirit, creosote oil and lubricating oil; the gas could be mixed with water gas to make a gas for

domestic consumption having the required number of heat units.

The problem is of great economic importance and much time and money has been expended in an attempt to evolve a process which will be practical from the standpoint of investment and return. Numerous inventions have been brought out, with varying success, some of them quite ambitious in extent, but mostly lacking in study and understanding of the fundamental principles involved.

The difficulties are largely mechanical. Coal, first of all, is in itself a poor conductor of heat. In the older high-temperature byproduct coke oven, a long, narrow room is filled with coal and the sidewalls heated by means of combustible gases to a high temperature. This heat, because of the high potentials used and the length of time over which it is applied, is gradually transmitted to the coal. While this process is slow—from 16 hours up—still, because of the large mass involved—16 to 18 tons—it is still within the limits of profitable application.

If, however, lower temperatures were used in the side walls, so that at no time would be the coal be subjected to a greater heat than 1,200 deg. F., the time would have to be so prolonged as to carry the process beyond any possibility of an economic return. It is evident then that another method must be devised.

DIFFICULTIES IN BAKING THIN COAL LAYERS

Attempts to solve the problem have been mainly directed along two lines—one being that in order to overcome the coal's inertia of heat transmission, it is coked in a thin layer which is spread by means of revolving paddles or screws over the walls of a strongly heated retort, the layer of coke thus formed being constantly removed. High heat potentials are used around the shell of the retort, but the temperature inside is supposed to be kept low by the constant agitation and admission of fresh, cold coal. This, of course, is not strictly a low-temperature process.

The other general line of procedure investigated has been to heat the coal contained in a retort to a uniform degree of temperature, by means of hot gases, circulating or otherwise, and at normal or reduced pressure. This is strictly a low-temperature process, inasmuch as the degree of heat to which any particle of the coal is subjected is never greater than the low-temperature range, which is 1,250 deg. F. However, the coking time cannot but be prolonged so greatly that the output will not be sufficient to assure commercial success.

The most ambitious attempt in this country has been made along the first lines. A little study, however, would show that the mechanical difficulties of this type of retort would be great. Coal, when heated, softens and

*Abstract of paper entitled "Low-Temperature Distillation of Coal," read before the West Virginia Coal Mining Institute, June 13, 1923. This is the system that Henry Ford is installing at the River Rouge Plant, Detroit, Mich., and Walkerville, Ont.

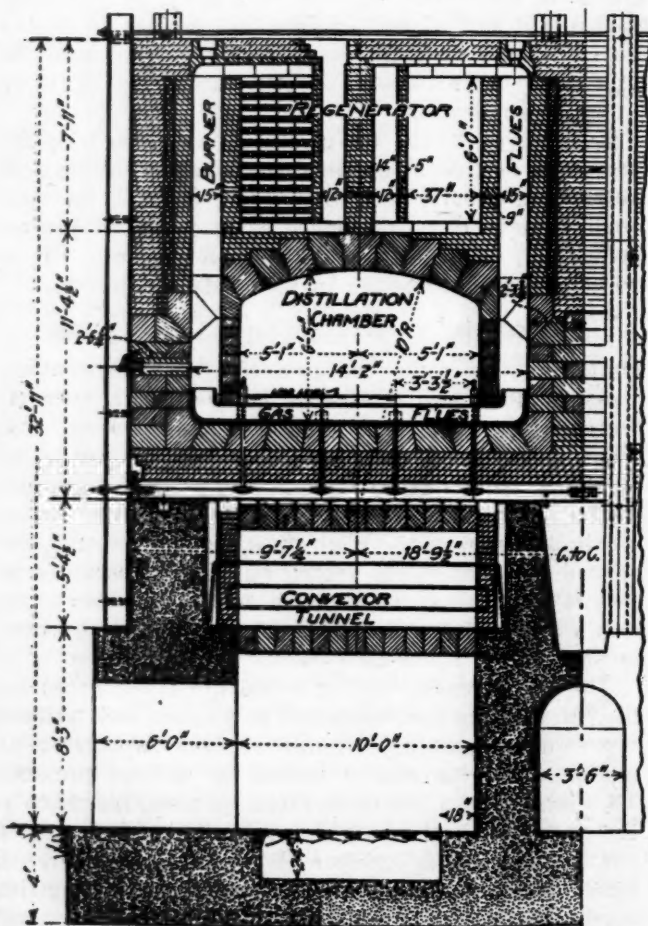
becomes sticky, and the spreading of it uniformly in a thin layer over the walls of the retort is a practical impossibility.

Further, under the pressure of the paddles or screws a hard layer of coke is inevitably built up on the walls of the retort. This makes it difficult for heat to be transmitted into the retort, and as it gets thicker it will stop the paddles or screw from revolving unless frequently removed. This necessitates closing down and cooling the retort, and a loss of production. Furthermore, the product will not be uniformly coked, because the conditions in all parts of the retort will not be the same.

Some particles are bound to be overheated and therefore overcoked, and other particles will not receive enough heat to drive off much or any of the volatile matter. The resultant product will be a mixture of coal, semi-coke and hard coke. Under these conditions the byproducts also are bound to be affected. There are other mechanical difficulties inherent in this type of retort, which need not be discussed at this time.

During the past year a type of low-temperature distillation oven has been developed in a practical way. It has already proved its ability to work almost indefinitely without mechanical trouble of any kind, and at the same time has a coking capacity per unit of investment about twice that of the present-day high-temperature byproduct oven. This coking unit is known as the Piron oven.

In the Piron system the coal is coked in a thin layer



SECTIONAL ELEVATION, EMIL PIRON OVEN

The oven used at Huntington, W. Va., here cross-sectioned, had a daily capacity of 25 tons and was a demonstration unit only. Lead rests on the top of gas flues and is kept molten by the heat conducted by them. On this lead, metallic conveying plates float carrying a half-inch of coal which by the time it has passed through the oven is reduced to semi-coke.

on a movable platform or a series of jointed metallic plates. The heat to distill the volatile matter is transmitted to the coal through the metallic plates, the heating element being a metal bath with internal heating flues. The temperature of the bath is easily controllable within narrow limits, and if desired need not vary 25 deg. F. in a month. No part of the coal is subjected to a greater heat than that necessary to distill it under low-temperature conditions, and therefore, the resulting products are uniform in quality. In fact, so far as the quantity of volatile matter left in the semi-coke is concerned, this can be varied within limits to suit the operator.

The process is a continuous one. Raw coal is fed continually onto the platform or conveyor. After making almost one complete passage through in the oven, the necessary quantity of volatile matter is all driven off, and the dry, porous residue drops off the plates of its own accord. There are no moving parts other than the conveyor inside the distilling chamber, and therefore the coal is not disturbed while in its sticky state.

The resulting residue is a semi-coke now known as carbocite. It is a soft, easily pulverizable substance, and in its natural state, as it comes from the oven, it can be burned directly under steam boilers for power-raising purposes. It is absolutely smokeless and burns with a yellowish blue flame not unlike charcoal. The heat is intense and the ash light and fluffy.

MORE HEAT PER TON IN CHAR THAN IN COAL

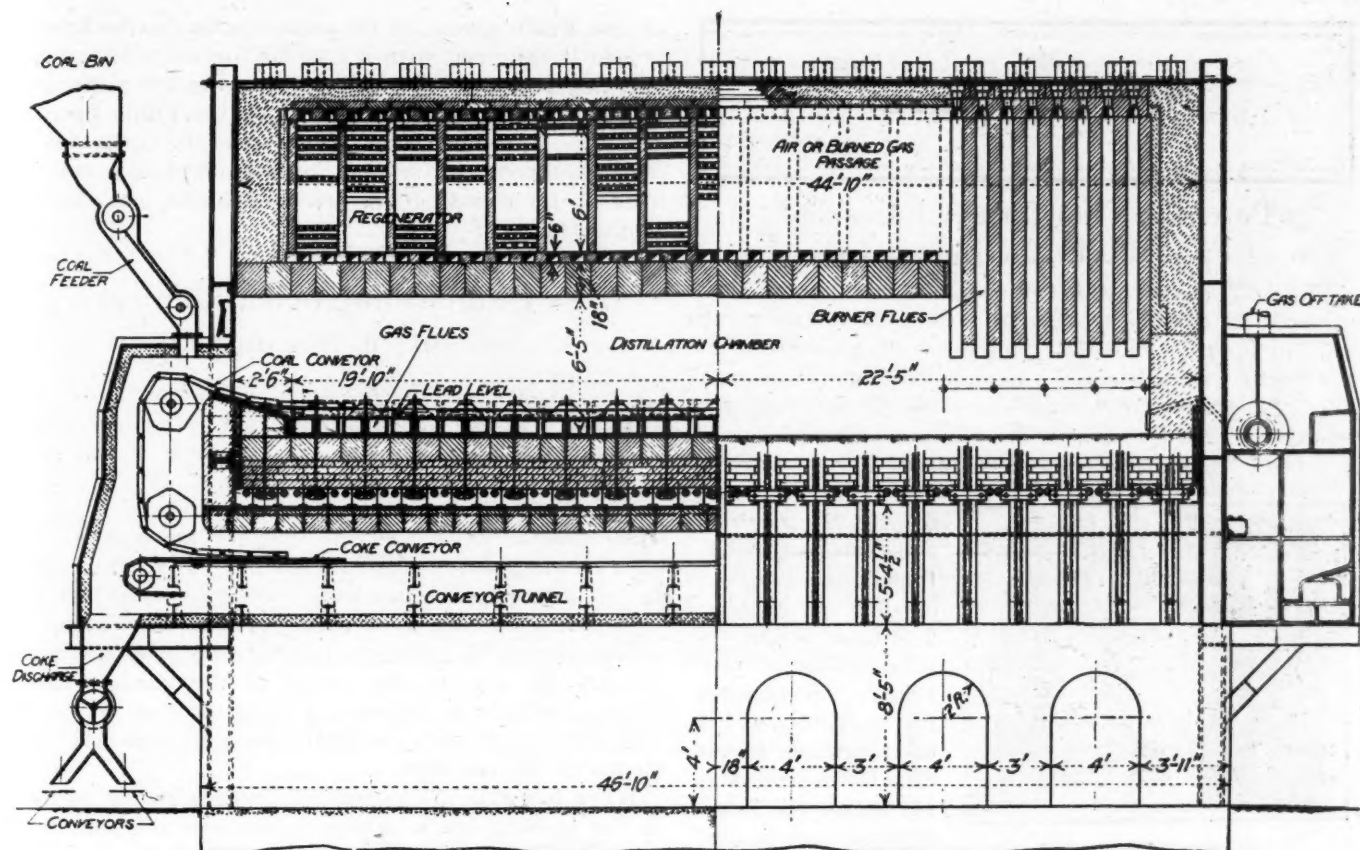
As compared with the coal from which it is made, carbocite will contain only from 10 to 12 per cent volatile matter. This can be increased, however, up to about 18 per cent at the will of the operator. It will be bone dry, and the ash will have been increased by the percentage of volatile taken out. That is, if you start with 8 per cent ash and 35 per cent volatile in the coal, the carbocite will have, say, 10 per cent volatile and 10 per cent of ash, but because the volatile matter left in the carbocite is largely hydrogen, there will be more thermal units per pound than in the coal from which it is made; this in spite of the fact that the percentage of ash has been increased.

Four methods are open for the commercial utilization of carbocite. First, as mentioned before, it can be burned directly under a boiler; second, it can be pulverized and burned in any way that pulverized coal is now burned; third, it can be, under suitable conditions, completely gasified; and fourth it can be briquetted into a fuel suitable for domestic or industrial purposes where a smokeless fuel is necessary and the quantity consumed per day is small.

The yield of tar by low-temperature distillation, as pointed out before, is much larger than by high-temperature distillation and will run from 20 to 30 gallons per ton of coal carbonized, the quantity and quality depending almost entirely on the kind of coal used.

LOW-BOILING FRACTIONS PREDOMINATE IN TAR

In this tar the low-boiling fractions predominate. These fractions are quite suitable for use in internal-combustion engines, and therefore the high-volatile coal of this state has now become an actual source of gasoline. It is unnecessary to point out the economic importance of this fact. It is quite evident to anyone that we are using up our natural resources of crude oil very rapidly, and this year will see a consumption of gasoline undreamed of even during the war period,



LONGITUDINAL SECTION OF OVEN SHOWING COAL FEEDING AND CONVEYING ARRANGEMENT

This unit is typical of the furnaces now being erected by the Ford Motor Co. of Canada, Ltd., at its Walkerville (Ont.) plant and by the Ford Motor Co., at its River Rouge plant, but the River Rouge furnaces are 10 ft. longer. The commercial oven will embody a clay refractory furnace 44 to 52 ft. long having two longitudinal

arched chambers 14 ft. wide and 6 ft. 5 in. in total height provided with curtain walls at each side to separate the heating and exhaust chambers from the distillation space. Cast-iron U-shaped flues in twin form connect the heating and exhaust chambers, the lower section of the flues being completely submerged in a bath of molten

lead with refractory protection for the upturned ends. These flues are closely placed, providing heating gas passages spaced 14 in. apart under the entire lead surface. Regenerators or recuperators rest on top of the oven proper. The coal is laid so thin on the conveyor that it readily takes up heat and is distilled.

when we supplied a greater share of the world's needs.

In the seven years between 1914 and 1921 the production of gasoline increased 426½ per cent; in 1914 the United States produced, in round numbers, five billion gallons of gasoline. The production this year probably will reach eight billion gallons.

Assuming that it is possible within a reasonable length of time to process fifty million tons of West Virginia high-volatile coal per year, what would it mean to this state in dollars and cents?

From fifty million tons of coal we would obtain 1,250,000,000 gallons of tar, 150,000,000,000 cu.ft. of surplus gas with a thermal capacity almost as high as that of natural gas, and 300,000 tons of sulphate of ammonia.

From this quantity of tar can be obtained 500,000,000 gallons of motor fuel equal, if not superior, to any now being produced from crude oil, and worth \$90,000,000; 150,000,000 gallons of creosote oil for creosoting poles, ties and timbers, a great deal of which is now imported, worth \$15,000,000; 300,000,000 gallons of lubricating oil, worth \$60,000,000; together with other recoverable values, amounting to \$15,000,000 to \$20,000,000 dollars more, a total from the tar of about \$180,000,000. The gas also might be sold for industrial purposes. Basing its value on coal at \$6 per ton burned under the boilers, it will bring in an additional income of \$40,000,000. The sulphate of ammonia will net \$10,000,000 more, or a total of \$230,000,000, or \$4.60 per ton of coal carbonized.

And we still have the carbocite left—37,000,000 tons of it—usable for any purpose for which coal can be

used. Briquetted it can be sold in competition with anthracite for domestic or other purposes. Not only is it a substitute for anthracite but it can actually be made a superior fuel, because it has less ash and no unconsumed particles are left in the ashes.

Natural gas is an ideal fuel, but the gas resources of West Virginia are rapidly being depleted. Today our industries are looking elsewhere for their power. With careful regulation natural gas as an economic domestic fuel may last for thirty years, certainly not much longer. What is going to take its place? That question can be answered now. Coal will be completely gasified. It will be brought to the mouth of the mines, treated in low-temperature ovens to recover the by-products, motor spirit, lubricating oil, ammonia, etc., and the resulting semi-coke completely gasified. The gas will then be pumped through pipe lines to the cities, and the byproduct shipped to consuming centers.

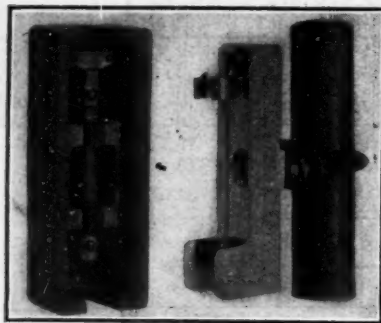
This idea while revolutionary, is within the bounds of possibility in the near future. In the meantime low-temperature ovens will be built for the more economical production of power. Already large plants for this purpose are under way. The most interesting phase of the low-temperature development, from the high-volatile coal-producer point of view, is the utilization of carbocite as a domestic fuel, because it will open up an entirely new field for this particular coal.

It also will have a marked tendency toward stabilizing the industry because the waster will be put to such a great disadvantage that he will have to drop out and leave the field to the people who are willing to utilize everything and waste nothing.

New Equipment

Potential Transformer Fuses and Fuse Blocks for Indoor Use

SAFETY on the front of switchboards having been brought to a high standard attention now is being paid to the most dangerous pieces of equipment behind the board. For instance, a new inclosed cartridge type potential transformer fuse and fuse block made for voltages of 2,500 to 25,000 for the protection of indoor potential transformers has been placed on the market.



2,500-VOLT FUSE BLOCK

Open view showing method of mounting the fuse in the cover. In renewing the fuse the cover and fuse are disconnected, making it safe to handle the fuse for renewal or inspection.

It can be used also to protect other circuits where the current does not exceed one-half an ampere. The fuses can be applied without preventive resistances in locations where the maximum short-circuit current does not exceed the interrupting capacity of the fuse. When a preventive resistance is used the short-circuit current will be limited, ir-

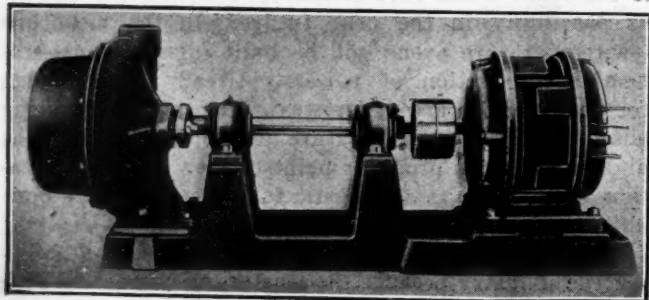
respective of the power back of the fuse, to a value within the interrupting capacity of the fuse. For 15,000- and 25,000-volt service the same fuse is used, with a different preventive resistance to limit the current and a different fuse base for each of the two voltages.

The 2,500-volt fuse base is provided with a cover of molded insulation which holds the fuse and provides for its safe handling. The higher voltage bases use corrugated post-type insulators.

Some of the special features of these fuses and fuse blocks, recently placed on the market by the Westinghouse Electric & Manufacturing Co., are their high interrupting capacities, strong non-absorbent fiber casings and provision for the proper venting of gases.

Ball-Bearing Pump Is Self Priming

AN INTERESTING feature of a new ball-bearing, motor-driven pump of 75 gallons capacity, known



SELF-PRIMING PUMP

The fact that this pump is automatically primed as soon as it is started obviates the usual worry that attends most centrifugal pumps.

as the Fulflo pump, is its self-priming characteristic. It also is equipped with a free-floating impeller having anti-clog features. In smaller capacities the same type of pump, which is manufactured by the Fulflo Specialties Co., of Blanchester, Ohio, may be used for a central-supply tank system for feeding heavy cutting tools or for pumping oil, brines, enamels, etc., in the shop or factory.

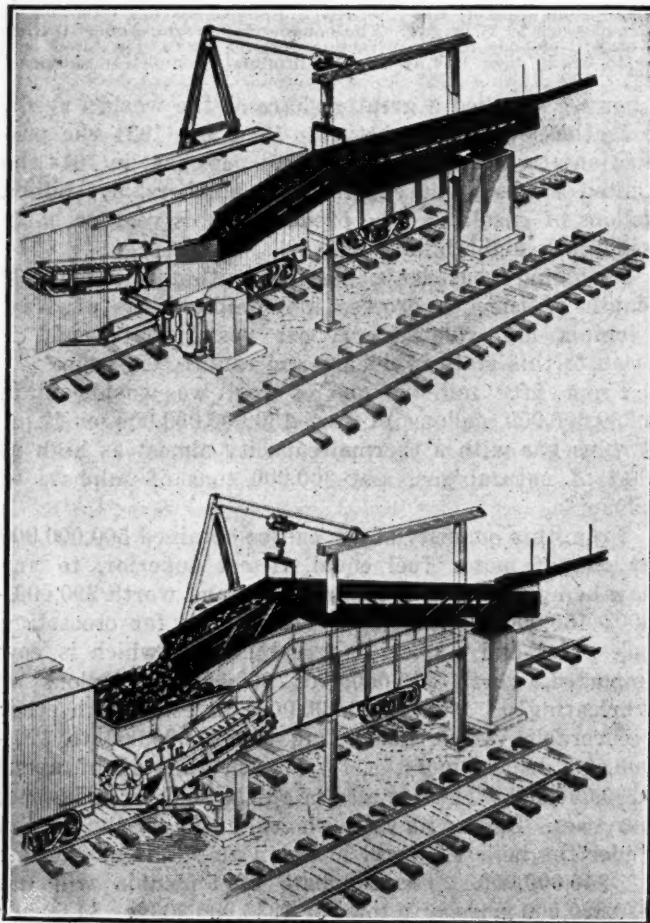
New Coal-Loading Boom Eliminates Necessity of Sorting Cars

A NEW and improved swiveling loading boom, depicted in the accompanying illustrations, is being put out by the Link-Belt Co., of Chicago. It is known as the "Knox Gon-Box Loading Boom."

An important feature of the Knox boom is its extreme flexibility, as it is able to swing and swivel with such freedom as to permit the loading of either gondola or box cars, from which fact it derives its name.

If gondola cars are being loaded the boom is swiveled over the center of the railroad track and thus delivers the coal to the center of the gondola car—acting similarly to ordinary loading booms. While in this position it also can be lowered to within a few inches of the car floor.

When box cars are loaded the boom is swung parallel to the loading track, where it delivers the coal to a chute leading to the box-car loader. Changes from box to gondola cars, or vice versa, can be made quickly and with ease.



FLEXIBLE COAL-LOADING DEVICE

Owing to the difference in types of cars to be loaded this boom will save much expense by eliminating the necessity of sorting out cars of various types at the mines.



Taking Coal by the Air Route to Coaling Station

Aerial Tramway at Williamson, W. Va., Eliminates Two Bridges, Much Track and Trestling, Yet Cuts Hauling Costs—Lifting Coal 85 Ft.—Easily Handles Thousand Tons in Eight Hours

BY CHARLES K. TRABER AND WALTER C. RICHARDS
St. Louis, Mo.

IN THE last few years the method of transportation in mountainous country from mine to railroad has been greatly changed. The aerial tramway, which has been used for twenty-five years or more,* at first almost entirely for the handling of high-grade ores in mountainous districts, has gradually extended its operation and now has been adopted by many industries. It seems destined within the next generation to carry a large proportion of the coal produced in mountainous regions, especially from the higher seams.

Ten years ago an aerial tramway was considered usually only after other methods of transportation had been eliminated on account of the difficulties of terrain. Now it often happens that an aerial tramway will compete with a railroad switch or other means of transportation under conditions favorable to the latter, for among other advantages it always delivers the coal directly at the top of the tippie, just where it is wanted, and without the expense of costly trestle work or elevating machinery.

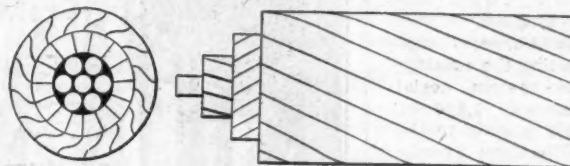
Aerial tramways may be divided roughly into two classes: (1) Continuous systems, where there are a number of carriers continually proceeding around a circuit, receiving the material at one terminal and delivering at the other, thus approximating a belt conveyor in its continuous supply of the product, and (2) the two-bucket aerial tramway, as it is usually

known. This latter consists of two usually rather large carriers, each moving on its own track rope, the one going out as the other returns.

This type of tramway is especially useful where the coal lies somewhat high on the hillside with the railroad in the valley and where the contour of the ground is such that the distance between these points can be made in a single span. Under these conditions the operation is by gravity, the carriers move at a high speed, and large capacities can be attained with an installation that is not only reasonable in first cost but extremely economical, both as regards maintenance and operation.

MAIN-TRACK CABLES MAY LAST TEN YEARS

Operation cost with this type of aerial tramway reduces itself practically to the wages of one man and a little oil for keeping the machinery lubricated. The maintenance cost represents the replacement of certain parts of the rolling stock at long intervals and the ropes at intervals even longer. Instances are on record where the main-track cables of this type of tramway, which represent the principal expense, have lasted as much as ten years. These cables, in order to give this service, must, of course, be well taken care of and should be of the locked-coil type, as shown in the illustration



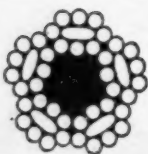
LOCKED-COIL MAIN-TRACK ROPE

By reason of its smoothness it forms a good running track for the buckets and will last for years. Moisture penetrates it with difficulty. It will be seen that this rope lacks the hemp core and is therefore less flexible than most ropes.

NOTE—The headpiece shows an aerial tramway at Williamson, W. Va. In the background can be seen the shed under which coal is conveyed by a belt to the loading terminal, which is close by a sidetrack where cars can be loaded for the market. The aerial tramway crosses the railroad track and steam in a direct line.

*An aerial tramway was erected by a Dutch engineer, Adam Wybe, for the city of Dantzic in 1644. The first ropeway of any note was built in the Hartz Mountains in 1860 by Baron F. F. von Ducker, but, of course, progress at first was slow, and in this country the time set by the author probably well delimits the period during which the aerial tramway has been generally known.

—EDITOR.



TRACTION ROPE
A flattened-strand rope is used for attaching the buckets.

accompanying this article. The use of this type of rope also insures long life for the carrier wheels, which is especially important on continuous-system tramways where a number of carriers are used.

Sometimes it is necessary to convey a long distance, and aerial tramways have been installed in this country as long as sixteen miles. Whenever the contour of the ground is such that intermediate supports are required, it almost always is necessary, except for cases of extremely small capacity, to use the continuous system. This type of tramway usually requires more labor than the two-bucket type, but it still affords an economical method of handling coal both as to maintenance and operation.

The continuous-system aerial tramway is less generally known in the coal fields than the two-bucket type, and therefore merits description in some detail.

Such a tramway has been designed and built for the Pond Creek By-Products Colliery of the Fuel Department of the Norfolk & Western Ry. It is located at Williamson, W. Va. This property was acquired by the railroad company for the purpose of furnishing coal to a large coaling station to be established in the Williamson yards. The mine openings are on a hillside somewhat less than half a mile from the coaling station.

The coal handled comes from two seams, the Thacker and the Pond Creek. The upper seam is 320 ft. above the level of the valley, but the lower seam is only 50 ft. above this lower level. Passing through a rotary dump, the coal that comes from the Thacker seam is fed to a rope-and-disk conveyor about 550 ft. long, which brings the coal to the level of the lower seam; at which point it is picked, and may be crushed if desired.

Here the coal from the lower level joins the stream of coal from above and is carried with it by a belt conveyor about 380 ft. long to the loading terminal of the aerial tramway leading to the coaling station already mentioned. This transfer point is arranged so that if the coaling station is not in need of this fuel,

the coal can be diverted to a similar belt conveyor which takes it to a side track where it is discharged into railway cars.

The aerial tramway is about 1,600 ft. long from loading point to coaling station and it crosses in that distance Pond Creek and the Tug River, both of which during heavy rains greatly overflow their banks. The elevation of the top of the coaling station where the coal must be delivered is about 85 ft. above the point where the coal is fed to the aerial tramway.

Consider now what this would mean if some other system of transportation were used. A railroad switch would mean two heavy bridges, and then the coal would be delivered only at the bottom of the coaling station and would have to be elevated with a bucket elevator or skip hoist. If a series of belt conveyors were used, it would also mean expensive trestle work.

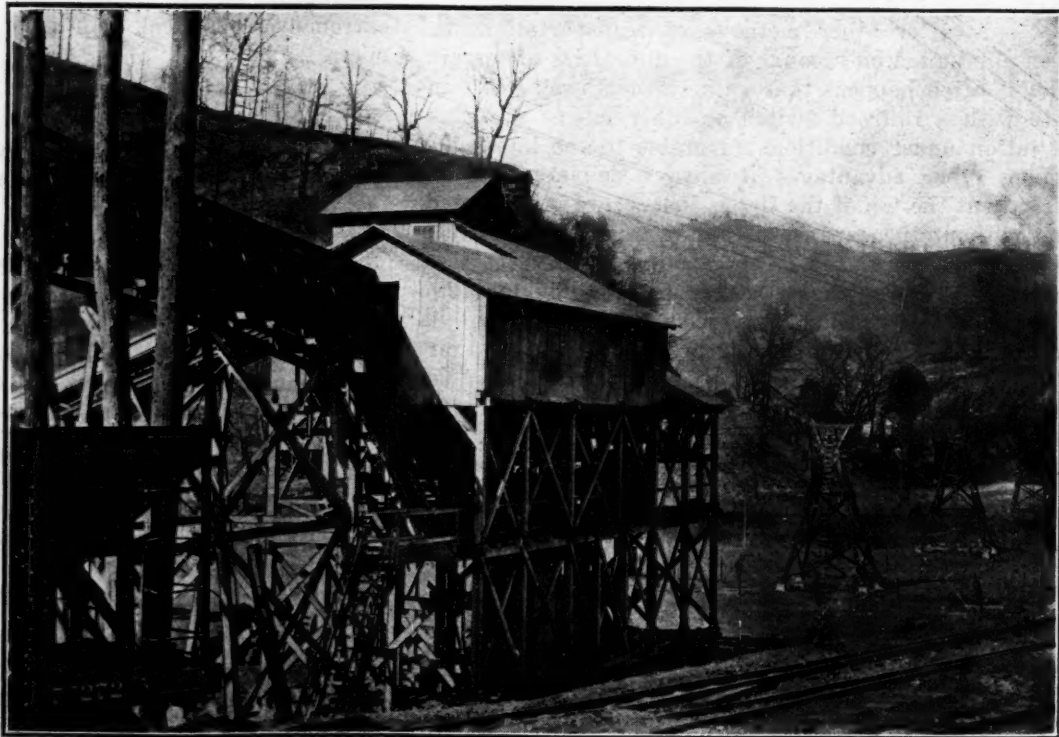
With the aerial tramway, however, it was necessary only to build at the loading end a simple structure of timber for receiving the coal from the bins located at that point, then to stretch the ropes from that structure to the top of the coaling station, with several intermediate supports, which are in the shape of A-frame towers. The coal, then, is fed to the tramway buckets through chutes from the storage bins; the carriers are automatically attached to the pulling rope and proceed at a uniform speed to the coaling station, where their load is automatically dumped, and they return to the loading station without further attention.

The only labor required is that of filling the buckets through special undercut roller-gate chutes, and as the buckets come to a stop before being loaded, there is no chance of spillage, unless the attendant is inexcusably careless.

The rated capacity of this aerial tramway is 125 tons per hour, but as much as 140 tons has been handled without difficulty. To do this three men are required; that is, three men represent the entire crew operating this aerial tramway. The gage of the tramway—the distance between track ropes—is 10 ft., and consequently there is no chance of the buckets interfering with each other in their travel over the line.

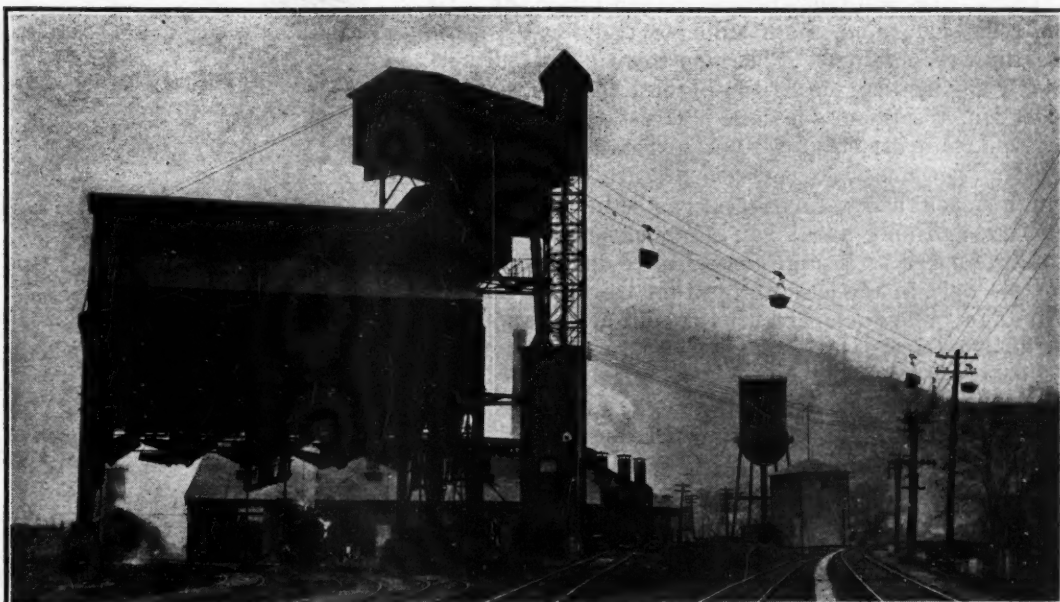
Loading Station

On the left can be seen the 380-ft. belt conveyor that brings up the coal from the crusher and picking booms to the loading station and the belt-conveyor that elevates to the tippie whatever coal is not needed at the coaling station. On the right, running toward the rear-ground, can be seen the A-frames supporting the continuous-system aerial tramway 1,600 ft. long leading to the Williamson yards. The track to the tippie can be seen in the immediate foreground.



How Coal Is Received

Coal comes to the yard, carried in equipment that utilizes space not needed for main tracks, side tracks, water towers, signal houses, round houses and what not—namely, the air. The coal gets to its destination without modifying an iota the original layout, which it could not do if brought by a track. This coaling station is on the Norfolk & Western Ry. Note how far the returning buckets are from those approaching the receiving tower. They could not injure each other in passing even in a heavy wind.



The buckets have a capacity of 35 cu.ft. and hang by a structural steel pendant from a truck equipped with four wheels. This four-wheel truck allows of a nice distribution of the load and prevents excessive bending in the track cable, which would be experienced with these heavy loads if a two-wheel truck were used. The truck cable is of locked-coil construction, which presents an absolutely smooth outer surface, and consequently wears but little, even after long use.

It readily can be seen also that this smooth surface is conducive to long life for the carrier wheels. The traction rope is of the flattened-strand construction, which affords a large area and smooth surface for the

action of the friction grips. The power required is furnished by a 25-hp. motor. Five cents per ton of coal handled will cover operation and maintenance and also will amortize the equipment cost in twenty years.

If conditions of ground had allowed the use of the two-bucket gravity type of aerial tramway the cost would have been even less. The equipment was installed at a much lower first cost than could have been achieved with any other method of transportation, faced as the designers

were with the attendant necessity of bridging the two streams and providing for the deposit of the coal at the top of the station.

The aerial tramway was designed, manufactured and installed by A. Leschen & Sons Rope Co., the special features of the coaling station being designed and erected by Roberts & Schaefer. The work was done under the general supervision of George Dunglinson, manager, fuel department, Norfolk & Western Ry., and under the direct supervision of W. A. Wilson, general superintendent, Pond Creek Colliery, and J. H. Dickerson, engineer.

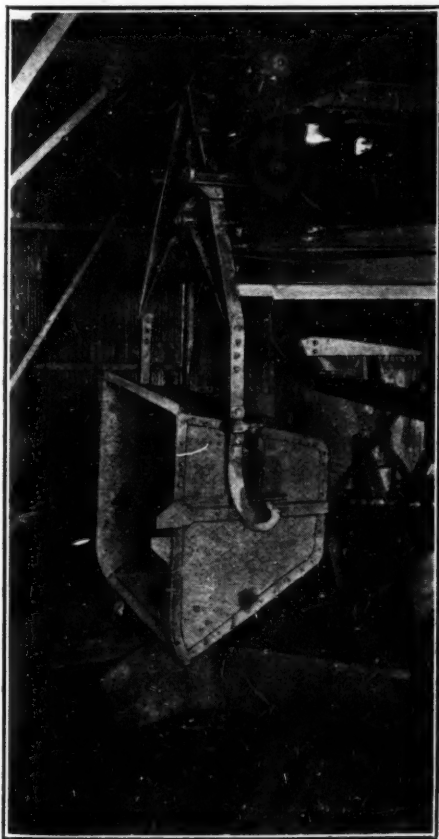
Dr. Morgan Discusses Semi-Coke Processes

ONLY thorough trial on a large scale and at great cost can determine the worth of Henry Ford's project for low-temperature carbonization of coal on a commercial basis, according to Dr. Jerome J. Morgan, member of the American Chemical Society and professor of chemical engineering in the Schools of Mines, Engineering and Chemistry of Columbia University.

"In any discussion of low-temperature carbonization of coal," says Dr. Morgan, "certain fundamental principles in fuel utilization must be kept clearly in mind. 'First: A pound of coal represents a certain quantity of latent chemical energy. Expressed in heat units for an average bituminous coal of medium ash and moisture content, this is roundly 14,000 B.t.u. per pound. This represents the total energy that can be obtained from this pound of coal. No method of treatment can possibly add to this energy.

"Second: Any process of carbonizing coal consumes energy which must be supplied from that originally present in the coal or, as is so often done in the laboratory, from some outside source. Hence the carbonization process is justifiable only when the value of the products of carbonization is greater than the value of the raw coal. In ordinary high-temperature carbonization of coal in a gas retort or coke oven the main products are coke and coal gas.

"The process is justified by the greater 'form value,' that is, value due to form, as a metallurgical fuel of the coke, or as a domestic fuel of the gas. The value of the byproducts, ammonium sulphate and coal tar, help bear the expense of the process, but alone would not justify its use.



CARRIER JUST DISCHARGED

The bucket goes back to the loading station thus tilted. The coal has fallen into the hopper of the coaling station.

"Third: In low-temperature carbonization of coal semi-coke, gas, ammonium sulphate and low-temperature tar are obtained. The semi-coke is not suitable directly for metallurgical fuel; in most cases it requires subsequent treatment for domestic fuel, and only about three-quarters of a pound of it is obtained per pound of coal. The gas from low-temperature carbonization, though richer than ordinary coal gas, is in much smaller quantity, and only about half as much ammonium sulphate is formed as in high-temperature distillation.

"It is only in the case of tar that we find a marked advantage in low-temperature carbonization, and it is to the low-temperature tar that we must look for a justification of the process.

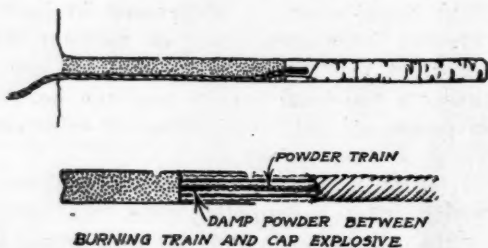
"Fourth: In considering the value of low-temperature coal tar there are many factors which must be balanced. The quantity obtained is considerably greater, often two or three times that from high-temperature distillation of the same coal. Its value, however, in the present market is rather doubtful. As it represents the first step in the decomposition of coal, its composition varies much more owing to the varying natures of the coals being distilled than does the composition of high-temperature tars.

"Many of the current claims for low-temperature tars are based upon work done in Germany on tars from German brown coals, which differ greatly in nature from American coals. This dangerous practice of reasoning by analogy has led to the publishing of many misleading statements.

"Fifth: Finally, whether any proposed process for low-temperature carbonization is a commercial success can be determined only by the balance sheet of a plant which has actually been operated on a large scale for a long time. If Mr. Ford, who has the money to spare, cares to undertake this costly experiment, the results will certainly be watched with great interest by others who have tried it and by American chemists and engineers in general."

Much Trouble and Danger from Explosives Incurred—and All for No Advantage

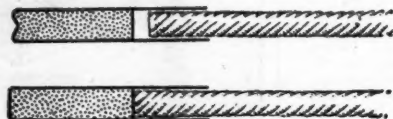
TIME often is best saved by spending it, and material sometimes is saved by a little frugal waste of it, as an E. I. duPont de Nemours circular written by Arthur La Motte points out. Don't crimp a cap on a piece of



fuse, if the ends of the latter have been exposed to damp air, until you have cut off and discarded about an inch of it. The powder core of the fuse takes up moisture at its end, and this damp powder refuses to burn, so that the spark from the powder may fail to reach the explosive in the cap. Result: An unexploded hole, waste of time digging it out, danger in that operation and risk that part of the cartridge thus extracted may fall into the coal unexploded to injure those who burn the fuel or who handle it around the mines, in the yard or at the point of delivery.

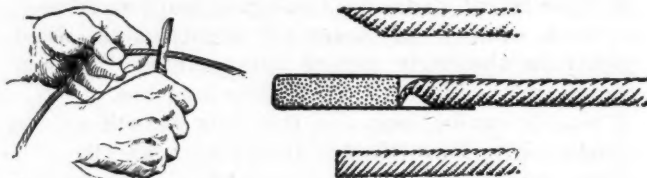


Again, cut off the fuse so as to reach at least 2 or 3 in. beyond the collar of the hole and crimp the cap on the freshly cut end; then you will have more confidence that the powder at that end which is in the cap will be dry and effective. The use of "short" fuse or "skin-em-

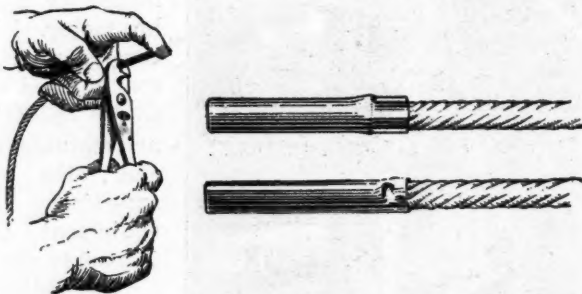


backs" is prohibited by law in some states. It is not only dangerous but wasteful, for the effect of the explosion cannot be as great as when the hole is tamped its full length.

Don't cut the fuse with a dull, dirty knife or a hatchet, which bruises rather than cuts its way through



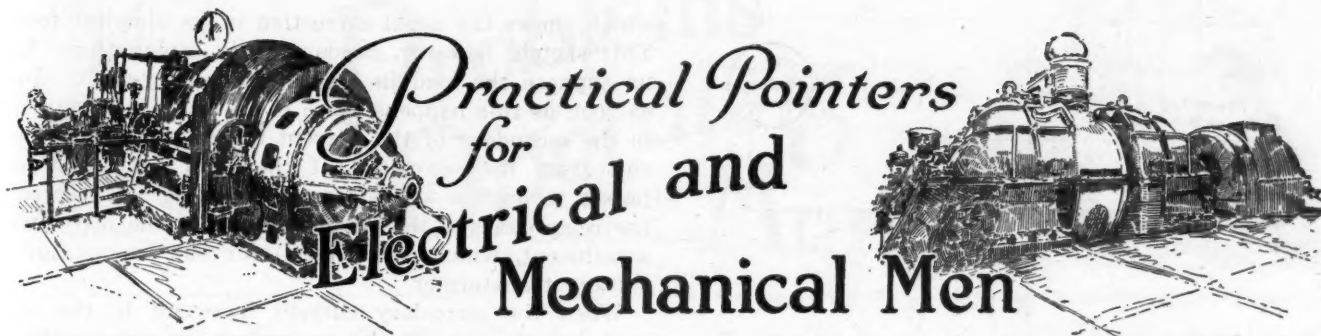
the fuse and is sure to smear some of the waterproofing across the powder train and make the work of the fuse ineffective. A cap crimper will make a straight cut and enable the blaster to bring the powder right up to the



fulminate. Some people cut the fuse with a long slanting cut. No surer and deadlier way of covering the powder at the end of the fuse with waterproofing can be devised. The waterproofing left by such a slanting cut is bent over as soon as it gets inside the cap and tends to insulate the powder from the fulminate. If you *must* use a knife to cut the fuse it must be clean and sharp and the cut must be square.

It is still necessary to add that blasting caps should not be crimped with the teeth, for men still continue to run these unnecessary risks despite all that has been said.





Track Device Automatically Regulates Traffic to Bottom of Slope

TRACK devices made to function by the passage of the wheels of mine cars through them afford automatic operation of track switches, detect loose wheels on the mine wagons and rerail rolling stock that is off the track. There remains another possibility in the use of track devices which heretofore has been little exploited, namely, to open a switch in an electrical circuit, thus lighting a lamp or ringing a bell to signify condition at the place of signaling to the place being signaled. Many opportunities are offered the mine electrician to do electrically what heretofore was accomplished by men. Here is one:

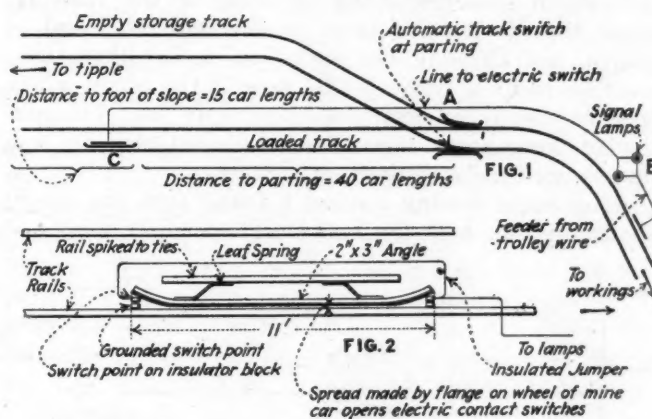
In the Cedar Grove slope mine of the Carnegie Coal Co., Studa, Pa., a loaded trip on its way to the surface encounters a sweeping curve before it arrives at the parting which marks the beginning of the double track on the slope bottom. To pull the loaded trip into the slope bottom would necessitate the construction of a run-around at a point beyond the big curve adjoining the parting and time would be lost in shifting the locomotive from the front to the rear end of the trip. Backing a loaded trip around a curve and through a parting switch is doubly dangerous. Consequently the Cedar Grove management decided that the loaded trip should be dropped to the slope bottom—see Fig. 1—by a flying switch at the parting. The locomotive switches to the empty track and is ready to pull out with the empty trip when the last mine car of the incoming loaded trip is in the clear.

There are two requisites to accomplish this maneuvering with safety: the motorman of the incoming loaded trip must be notified whether there is room or not in the clear for his trip, and the track switch at the parting must be automatic to turn the locomotive to the empty track and direct the mine cars to the loaded track.

At the point *B* are located two green signal lamps. When these lamps are lighted the motorman knows that there is sufficient room on the loaded track for his trip and, accordingly, he does not stop there, but if the lamps are out, he knows that his trip will not clear the parting at point *A*. Consequently, he waits for the signal from the lighted lamps before he drops his trip to the bottom. The distance *AB* is great enough to permit the loaded trip to get up sufficient speed to make the flying switch at the parting *A*. The automatic track switch used at this point is of popular make. A lever on the locomotive throws the switch one way and then another, before and after the passage of the locomotive through it. Though this automatic switch is not new its use in conjunction with the track device herein described is novel and saves the employment of one man.

At a point 15 car lengths from the foot of the slope and 40 car lengths from the parting is a track device which opens or closes the electrical circuit of two signal lamps. This device consists of an angle iron 11 ft. long which is held to the inside of one rail by two leaf springs bolted to the angle and to a short rail which is spiked to the ties, as in Fig. 2. To each end of this angle iron is attached a switch point on an insulating block, which makes contact with a grounded switch point on the main rail.

The two insulated points are connected to each other by means of an insulated jumper and are connected with the lamps by a line which originates as a feeder



FIGS. 1 AND 2—AUTOMATIC SIGNAL INCREASES SAFETY AND ECONOMIZES IN LABOR

Track devices on mine-haulage systems make visual signaling very reliable. Here transportation is made both quick and safe.

from the trolley. The return of the circuit is through the track. The circuit is kept open by the spread of the angle iron through the agency of the wheels of the mine cars, which simultaneously spread the contact switches in the electrical circuit. When the last car in a trip passes through the track device the tension of the leaf springs presses the angle iron to the main rail and closes the circuit, thereby lighting the signal lamps at *B*, which notifies the motorman that there is space in the clear for the storage of 40 mine cars on the loaded track

A. F. BROSKY.
Pittsburgh, Pa.

How Induction Relay Operates on Overload

LOOKING over some of my earliest notes, written soon after I began to work in the electrical engineering coal-mining field, I found some sketches which I made on a study that bothered me not a little before I finally found time to work out an explanation for myself. These sketches and notes I am now passing on to you in the hope that they will be of use in explaining a point which may possibly be troubling many a colliery electrician and also in hopes that they will prove the sim-

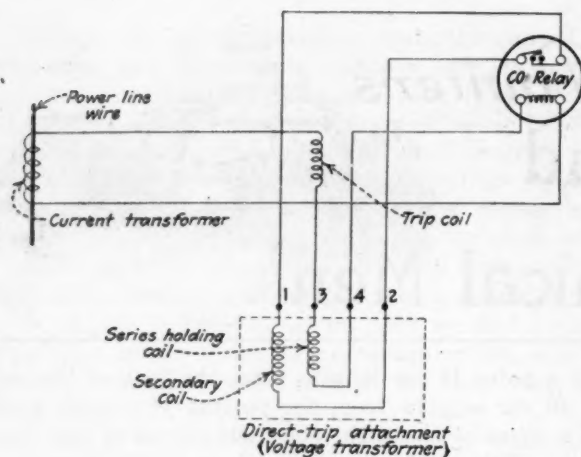


FIG. 1—OVERLOAD RELAY CONNECTIONS WITH DIRECT-TRIP ATTACHMENT

When a load comes on the power line the relay starts to operate, giving the desired time delay. When this predetermined time is up the relay closes the secondary coil circuit of the direct-trip attachment, thus causing the current transformer to send sufficient current through the trip coil to operate the trip and cut off the overload.

plicity of many supposedly complicated pieces of electrical equipment.

For some time I had been wondering about the mystery which surrounded the operation of the Westinghouse type C O overcurrent or overload relay and of course, not knowing the operation, I felt that there must be many a relay of this type at the mines which was incorrectly connected or incorrectly set. The particular thing about this relay which troubled me was its use with the direct-trip attachment.

After some delving around I found that the circuit shown in Fig. 1 is the one most commonly used and

which shows the usual correction in its simplest form. This sketch, however, needs a little explanation. Let us suppose the load in the line wire increases. Just as soon as this happens there is an increase of current in the secondary of the current transformer. The circuit from the secondary of the current transformer passes through a series circuit including the trip coil, the relay coil and the secondary coil of the direct-trip attachment, which we will call for our explanation a voltage transformer.

When the secondary current increases in the current transformer all the equipment in series with it receives a greater current. Under these conditions the current is not sufficient to trip the circuit breaker on the line to be protected but is sufficient after a time delay, governed by the relay, to close the contacts of the relay. When these contacts close, it closes the secondary coil of our voltage transformer (direct-trip attachment) and it now being a transformer with a closed circuit on its secondary it quickly takes a heavier current in its primary, which will be noted is the secondary of the current transformer. This quick rush of increased current in the secondary circuit then becomes strong enough to operate the trip coil, which in turn trips the circuit breaker and relieves the power circuit of the overload.

ELECTRICAL ENGINEER

Speeding Up Spontaneous Combustion

AN UNUSUAL piece of apparatus has just been perfected at the Pittsburgh Experiment Station of the Bureau of Mines in connection with a study being made on the conditions favoring spontaneous combustion of coal. This apparatus permits of continuous measurements of the temperature of coal samples as they are subjected to conditions favoring spontaneous combustion. Oxygen is passed through the sample in order that it may develop heat in a much shorter time than would be required under conditions of actual storage. In this way it will be possible to determine which coals are most likely to take fire. The apparatus was designed and built by A. C. Fieldner, superintendent of the station, and J. D. Davis, chemist in charge of fuel chemistry.

Dr. Reinhardt Thiessen is engaged in a study of the constituents of coal. By isolating these constituents it will be possible to determine which of them are most prone to cause spontaneous combustion. Once the particular offenders are known it is believed that it will be comparatively easy to designate the relative susceptibility of various coals to fire.

The tests thus far conducted show that heating is comparatively slow until a temperature of 150 deg. F. is attained. From that point the curve steeply rises to the temperature where combustion begins.

THE REPORT OF SUB-COMMITTEE No. 4 of the International Mine-Rescue Standardization Committee, on the use of mine-rescue apparatus in coal mines, recommends that the minimum number of men trained at a mine be 10 per cent of the men employed at that mine, with an absolute minimum limit of 10 men. As many as possible outside men familiar with the underground workings should be included. In selecting rescue men considerable care should be used, both as to physical and mental fitness and also as to experience in and familiarity with the underground workings.

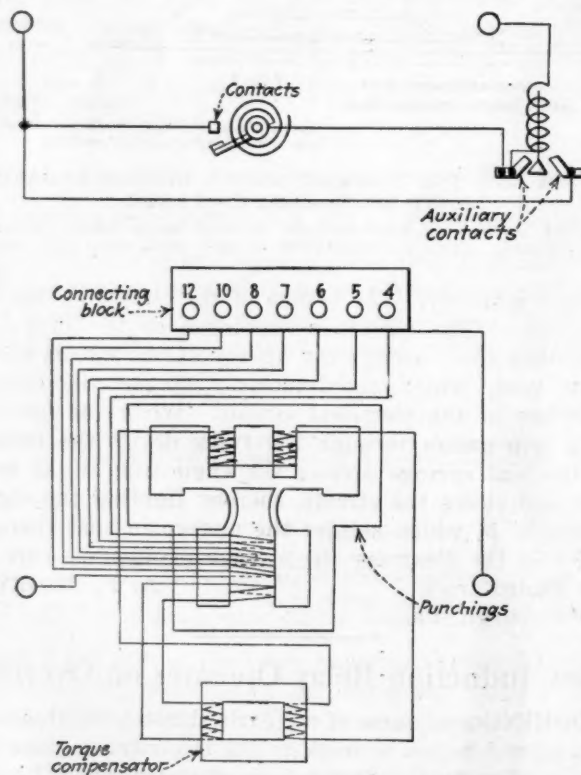


FIG. 2—INTERNAL CONNECTIONS OF RELAY

The upper studs connect to the contacts, which when closed are relieved of the heavy current by the closing of the auxiliary contacts. Time delay is accomplished by changing the distance between the contacts. The lower studs connect to the relay coil which controls the current setting. Cutting in or out sections of the relay coil by changing the position of a contact-making screw in the connecting block determines the load setting.



Problems of Operating Men

Edited by
James T. Beard



Posting the Face of the Coal in Driving Rooms

**Danger When Working Under Drawslate—
Reluctance of Miners to Set Needed Posts—
Posting the Coal Face in Machine Mining**

SAFE timbering of mines, particularly that of the coal face when driving rooms, is of such importance that volumes might be written on the subject. However, giving heed to one or two recognized facts in timbering will prove more effective in the avoidance of danger than a multiplicity of rules and regulations regarding safety.

Reducing the entire subject to a principle, there is one truth that is the underlying foundation, which I would express in the following words: "One post promptly and properly set is a greater safeguard than a world of experience, in the mining of coal."

DANGER UNSUSPECTED WORKING UNDER DRAWSLATE

Perhaps one danger that is more often disregarded by the experienced miner is that to which he is exposed when working under a drawslate. Nothing is more precarious than the presence of hidden and unsuspected danger, which is commonly the situation in nine cases out of ten where the coal is overlaid with a drawslate that has every appearance of being sound.

Only recently I heard a miner tell his foreman that the drawslate beneath which he was working did not need posting. Upon the foreman's insistence that a number of posts should be set at once the miner replied, "Why man, do you suppose I've been a miner for thirty years and don't know when a place is safe?" That such is the attitude of most miners or that, in many instances, they are permitted to have their own way regardless of mine rules and regulations cannot be denied.

The point I wish chiefly to emphasize is the reluctance of a large class of experienced miners to set the timbers that they must know are needed to insure safety and give them the necessary warning of imminent danger. It is this reluctance of miners to perform the required work and their almost universal disposition to postpone the timbering of their places that is responsible for a very large percentage of accidents at the working faces in mines.

NEED OF SETTING FACE TIMBERS IN MACHINE MINING

In machine mining we face another situation equally bad and difficult to overcome, because it imposes some extra labor on the part of the miners and the machinememen who cut the coal. Here also opinions are largely influenced by the task that a proper regard for safety imposes on all workers, who are too often willing to assume risks rather than perform what they may consider unnecessary labor.

On his visit to a certain mine, recently, a certain inspector insisted that posts be kept within six feet of the face of the coal, which was being cut with machines. Both the foreman and the machine runner claimed that they must have 14 ft. between the posts and the face of the coal. The foreman stated emphatically that a place cannot be cut if the posts are closer than 14 ft. from the face. Much time was spent in arguing the matter before the men were finally compelled to accede to the demands of the inspector.

SAFE MINING REQUIRES STRICT DISCIPLINE

Situations such as these bring to my mind forcibly what is the one greatest need in the safe mining of coal; and that is discipline in compelling compliance with the safety rules and regulations of the mine. A miner's professed experience must not exempt him from obedience to instructions; and the foreman's desire to produce coal at low cost must not disregard safety.

What can be done in this respect can be clearly seen by visiting the Pike Floyd mine, at Betsy Layne, Ky. In that mine we find each miner sets three posts close to the face before shooting his coal. Should the posts be knocked out by the shot they are promptly reset before other work is done in the place. Here the machinememen cut more coal than the average and do it with the posts set within 6 ft. 3 in. of the face. The conclusion is that the workers in that mine make safety the first consideration.

GEORGE EDWARDS.

Pikeville, Ky.

Miners Drawing Lots for Working Places

Plan not applicable to this country—Inequalities of the system—Miners should be allowed to choose their own partners.

MY ATTENTION was recently called to the letter of William Allan entitled "Caviling System in England," *Coal Age*, Jan. 25, p. 185. The letter describes a system said to have been practiced in the north of England, which I frankly admit is news to me, I not having heard of it previous to reading that letter.

Briefly described, the system is one in which the miners were compelled to draw lots for their working places, at the beginning of each three-month period. Whether the place was good or bad the miner had to submit to his lot and continue to work the place for the next three months, hoping all the time that he might draw a better place the next quarter.

To say the least the plan is a unique one; but, in my opinion, it would not prove satisfactory in this country. In his letter, Mr. Allan claims that it insured a square deal for all the miners and was profitable for the operator. Regarding the latter statement, there can be little doubt that the operator would profit by the system, as he would not have to worry about the working of the poorer places in his mine.

Compelling a miner to work a bad place where, for three months, he can only earn a bare existence, while other miners close by have good places in which they make double the amount of wages with less labor, does not appeal to me as "a square deal" or one that could be put in practice here with any assurance of success.

In every mine there are hard places that must be worked; but, in all fairness and justice, the miner should be paid for his extra labor, so that he will be able to earn equal wages with those who are given better places. It is no fault of the miner that the coal in his place is thin, or there are boulders in his path, or the nature of the roof requires special timbering. These are burdens that fall to the lot of the operator on whose shoulders they should rest.

"STRANGERS' HOME" AND "CORN-BREAD ENTRIES"

In my own experience as a miner, roof conditions and the thickness and hardness of the coal would change frequently and sometimes very suddenly. Speaking in mining parlance, mines where these hindrances predominate have their "Stranger's homes," their "Corn-bread entries," and the like, because of the natural difficulties in the earning of a good living in such places. It goes without saying that such mines have few steady miners but subsist on a floating population.

In order to appreciate the inequalities of mining coal under a system that takes no account of differences in working conditions, we have only to recall that, but a few years ago, the price paid the miner for digging coal was the same regardless of the kind of coal or other conditions under which he must work. The man digging coal three feet thick, on the side of a steep rock and under a bad top, received no more pay, per ton of coal mined, than the man working where the coal was six feet thick and level, with a good roof above the seam that required no particular attention.

Since then it has come to be recognized that there is nothing square in such dealing. A scale of prices has now been established for different thickness of coal, and allowances are made for bad roof and other unfavorable conditions. The result is that the miner working a bad place is now able to earn about as much money as the men in a good place. The foreman, of course, is compelled to use good judgment, in order to get the coal mined at the least expense, and encourage the men working the poorer places, by promises of a better place when that is finished.

ADVANTAGE IN MINERS CHOOSING THEIR PARTNERS

A more promising feature, however of the caviling system mentioned by Mr. Allan is the privilege afforded every miner of choosing his own partner. This reminds me of an incident that came under my observation several years ago. At that time jobs could not be picked up every day, at coal mines, as there were more men than places in which they might work. The result was that the majority of the miners were slow about quitting their places.

The incident I have in mind related to two miners who were put to work in the same place, the one being an old man and the other much younger. Both men were selfish and each wanted to boss the place. Naturally, it was not long before they were at outs with each other. Not being able to give them separate places, the foreman divided the room, giving one man the right and the other the left side of the breast, with the track between them.

Each man did his own shooting and timbering, but they both used the same powder keg and loaded their cars together. It is not strange that when a shot of one or the other proved bad there was much growling and the chances of dispute between the men were numerous. Today, however, miners are given more privileges and consideration in the choosing of the working partners. As Mr. Allan has suggested, working alongside of a man with whom you are not on friendly terms is a disagreeable experience.

JOHN ROSE.

Dayton, Tenn.

Crumb Coke

Experience of a consumer in burning what was bought and paid for as "coke" but needs to masquerade under a title more closely descriptive of its real character.

BEING a mechanical engineer and professing to know a little about the combustion of coal, I sent some instructions recently to a near friend, whom I knew was having trouble in his plant, owing to the scarcity of coal. In reply, he came back with the following, which may be of interest by way of amusement:

"Thanks for your advice as to how to save coal. You may be able to tell me how to get the coal, as I am using something that was bought and paid for as 'coke.' It reminds me of an article, headed 'Grudekoks,' (*Coal Age*, Vol. 23, p. 175) I read some time ago. The term described a new fuel and meant 'Embers coke.'

Did you ever see soft 'Crumb Coke?' No? Well, you are not a high-class M.E. until you have handled and tried to burn that article. It has a wonderful odor while burning; forms a crust like the top of a volcano and keeps the heat securely locked beneath.

When all that was combustible has finally been consumed and fallen through the grate as ash and there is nothing to support the crust it settles down on the bars in the shape of what our stokers call 'grate joy killers,' otherwise, 'klinkers.' In my opinion, they well deserve the name first given."

This letter of my friend probably describes the experience of many other consumers of coal.

Newark, N. J.

N. G. NEAR.

Multiplying Airways in Mines

Development of simple rule for finding increase of quantity due to multiplying airways one or more times in a shaft mine.

NOT long ago there appeared in *Coal Age* a problem relating to the increase of quantity that resulted from the addition of another airway of the same size and length as the present airway. The solution assumed the power on the air remained constant and it was found that the quantity of air in circulation increased from 10,000 to 11,696 cu.ft. per min.

The first solution to this problem is found on page 1002, Vol. 22. Later, I gave a second solution, which appeared in the issue May 3, p. 722. Studying over the matter since, I have worked out a simple rule for ascertaining the increase of quantity when the number of airways in a mine is increased two, three or any number of times, assuming the power on the air remains constant. The solution also assumes that the resistance of the original airway is equal to the total resistance of the two shafts, upcast and downcast. Calling that resistance unity or one, the combined resistance

of the two shafts and the original single airway is two.

The rule is as follows assuming a constant power on the air and the resistances of the two shafts and original airway equal, multiply the original circulation by the cube root of twice the square of the number of airways in the mine, divided by the square of that number plus one.

For example, if the original circulation was 10,000 cu.ft. per min., the addition of another airway of equal size and length to the first will increase that circulation to

$$10,000 \sqrt[3]{\frac{2 \times 2^2}{2^2 + 1}} = 10,000 \sqrt[3]{\frac{8}{5}} = 11,696 \text{ cu.ft.}$$

Again multiplying the number of airways in the mine three times, gives for the quantity of air circulated by the same power

$$10,000 \sqrt[3]{\frac{2 \times 3^2}{3^2 + 1}} = 10,000 \sqrt[3]{\frac{18}{10}} = 12,164 \text{ cu.ft.}$$

HOW THE RULE IS DEVELOPED

The rule I have mentioned is found by first assuming the quantity of air constant and calling the power absorbed in passing that quantity through the two shafts unity or one, the total power absorbed in the two shafts and the single airway is then 2. But, since the power varies directly as the rubbing surface and inversely as the cube of the sectional area, or as n/n^3 , or $1/n^2$, n being the number of airways in any case, the power absorbed by the two shafts and n airways is $1 + 1/n^2$, or $(n^2 + 1)/n^2$. Then, finally, increasing this power to the original amount, remembering that the quantity of air varies as the cube root of the power, gives the proportion

$$\sqrt[3]{\frac{n^2 + 1}{n^2}} : \sqrt[3]{2} :: Q : x = Q \sqrt[3]{\frac{2n^2}{n^2 + 1}}$$

In this proportion, Q is the original quantity passing in the two shafts and single airway, n the number of airways and x the quantity circulated in n airways, under the original power.

Retimbering a Shaft Bottom

Decaying and broken timbers overlaid with loose material presented a dangerous condition—Heavy jacks used to force new timbers into position.

READING an article that appeared not long ago, in *Coal Age*, concerning the replacing of old timbers having 15 ft. of loose slate lying above them, recalled a similar experience in my own practice. The condition is one that mine foremen are often compelled to face and calls for the exercise of their best judgment and skill in performing their work.

The instance I have in mind occurred when accepting a position as foreman at an old mine, which had fallen into a condition that would require much labor and time to restore, before active work could be again resumed. On taking charge of the mine, I immediately found that it would be necessary to retimber the shaft bottom.

Starting from the shaft and extending back for a distance of about 75 ft., the old timbers had begun to decay and many of them were breaking under the load of loose material above them. The prospect was a dangerous one.

After making a short survey of the situation, I ordered a sufficient number of 12x12 in. timbers, 15 ft. long, to enable me to make a good substantial job. I

then secured from the section hands on the railroad, two heavy pump jacks. These, together with a good stout timber cut to a suitable length. I intended to use for the purpose of forcing the new collars or crossbeams into position.

When this material was on hand and everything ready the work was started at the shaft. A new collar was brought and raised to the roof where it was supported on two temporary legs. The position of this timber was midway between two of the old timbers. The two jacks were then brought into requisition and, by their use, the new collar was forced up to a firm position against the old overhead lagging that was still in fair condition.

When this timber had been forced up as far as it would go and made level, measurement was taken for the permanent legs. After these had been finished and stood in place the jacks were released and the collar beam allowed to settle on the two legs. In the same manner, other timber sets were placed in position, one after another, until the entire job was completed. Later, the old broken timbers were taken down and removed from the mine. I thought this brief account might be of some assistance to others in a similar situation.

Hillside, Ky.

O. KENNETT.

Inquiries Of General Interest

Available Tonnage Underlying a Coal Property

Estimated Tonnage Based on Percentage of Extraction and Allowance for Screenings—These Factors Vary and Must Be Taken Into Account

CONTEMPLATING the leasing of a large coal tract consisting of 1,110 acres, it became desirable to form a fairly close estimate as to the amount of available coal underlying the tract. The record of the prospecting has showed the presence of three seams of coal above the drainage level and three other seams lying below that level. The former have a thickness of 3 ft., 5 ft. and 4 ft., respectively, while the three lower seams each have an average thickness of 5 ft.

Two parties have made widely varying estimates as to the amount of coal underlying this tract and available for extraction. For example, A reports an available tonnage of 47,952,000 tons, while B's estimate is much lower, his report showing an approximate amount that he says will not exceed 35,864,000 tons. It would be interesting to know which of these estimates is more nearly correct.

Before closing the deal for the leasing of this tract, which we have held back awaiting reliable estimates on the probable available coal, we are desirous of ascertaining as nearly as practicable what is the reason for the extreme divergence in the figures that have been given as stated above.

W. Va.

MANAGER.

Estimates on the available tonnage underlying a coal tract will vary according to the assumed basis of figures.

Taking the average specific gravity of bituminous coal as, say 1.3 and its weight $1.3 \times 62.5 = 81.25$ lb. per cu.ft., makes the weight of coal in place, per foot-acre.

$(43,560 \times 81.25) \div 2,000 = 1,770$, say 1,800 tons.

In estimating the available tonnage, or the weight of coal that can be mined and marketed, it is necessary to assume a probable or possible percentage of extraction. This will vary from 80 to 90 per cent or more depending on the method of working and the style of equipment. For example, assuming a 90 per cent extraction and a mine-run basis of shipment, would make the

available tonnage from 1,110 acres underlaid with these six seams aggregating a total thickness of 27 ft.

$0.90(1,800 \times 27 \times 1,110) = 48,551,400$ tons.

Again, assuming an 80 per cent extraction of coal and making an allowance of $16\frac{2}{3}$ per cent for screenings, the weight of lump coal available for shipment would be

$0.80(1,800 \times 27 \times 1,110) \frac{5}{6} = 35,964,000$ tons.

Finally, we would say that the first of these two estimates represents the basis of A's figures, while the second is probably the basis of B's estimate.

Examination Questions Answered

Alabama Firebosses' Examination Birmingham, Jan. 22, 1923

(Selected Questions)

QUESTION—*In an airway 8 ft. wide and 6 ft. high, the air has a velocity of 240 ft. per min. What is the volume of air passing per minute?*

ANSWER—The sectional area of this airway is $6 \times 8 = 48$ sq.ft. Assuming the given velocity is an average for the airway, the quantity of air in circulation is $240 \times 48 = 11,520$ cu.ft. per minute.

QUESTION—*Do you favor mixed lights in a mine where explosive gases are generated? Give full reasons.*

ANSWER—No. In a mine generating explosive gas in quantities requiring the use of safety lamps, none but such lamps should be used. In other words, the mine should be worked exclusively with safety lamps. If open lights are allowed in certain parts of a mine generating gas in quantities that require the use of safety lamps in other sections of the mine, there is always the possibility that a man carrying an open light on his head will enter a section where safety lamps are required. He will do this thoughtlessly and without having any wrong intentions, but the consequences are the same. Again, a fall of roof, occurring in the section where gas is generated, may drive the gas out into other parts of the mine where open lights are in use. and it will be ignited before the men have any warning of their danger.

QUESTION—*What are the advantages obtained from having safety lamps shielded?*

ANSWER—Safety lamps are shielded in order to protect the flame from a strong draft striking the lamp, or from a sudden concussion of the air, which might force the flame through the wire gauze and ignite the gas-charged air surrounding the lamp. It often happens that a safety lamp is swung to and fro by a man when walking and is thus subjected to a greater pressure than is safe. The shielding of the lamp reduces this danger.

QUESTION—*What precautions should be taken in the use of safety lamps in gaseous mines?*

ANSWER—In the first place, none but approved types of safety lamps should be used. These lamps should be owned by the company and kept in separate lockers or pigeonholes, or hung on individual hooks in a lamp-

house. A competent and reliable person should be given charge of the lamproom, and all lamps should be thoroughly cleaned, examined and filled when delivered there at the close of each shift. Every man's lamp should be numbered to correspond with the check that is given him in return for his lamp. The lamp, after being cleaned, filled and examined, should then be hung on a hook or placed in a pigeonhole numbered to correspond with the number on the lamp. In the morning, each man receives his lamp, it having been first lighted and properly assembled. The man's check is hung on the hook or put in the pigeonhole from which this lamp was taken. When this plan is followed, it furnishes a good record of what men are in the mine and who has not reported for work.

QUESTION—*How long would you allow a safety lamp to remain in an explosive mixture of gas?*

ANSWER—No safety lamp should be exposed to a fire-damp mixture after the presence and character of the gas has been made known by the appearance and action of the flame within the lamp. Immediately on the observance of a flame cap and estimating its height the lamp should be cautiously withdrawn from the gas, avoiding any sudden or quick movement that might force the flame through the gauze and ignite the gas surrounding the lamp.

QUESTION—*When and where must danger signals be placed, in a gaseous mine, to comply with the Alabama Mining Law?*

ANSWER—The law (Sec. 32) requires the fireboss, "after each examination, to leave, at a point at least 25 ft. distant from the face of every slope, drift, entry or air-course and at the neck of every room examined by him, a conspicuous sign or mark indicating the presence of gas in dangerous quantities discovered by him, together with a memorandum of the date of his examination." Sec. 41 of the law also requires that the entrance or entrances to worked-out and abandoned places containing an accumulation of explosive gas shall be properly fenced off and cautionary notices posted on said fencing to warn persons of the danger therein.

QUESTION—*Why is it that marsh gas (CH_4) is generally found lodged near the roof and carbon dioxide near the floor?*

ANSWER—Marsh gas or methane has a specific gravity of 0.559, which makes it only slightly more than one-half as heavy as air of the same temperature and pressure. On the other hand, carbon dioxide has a specific gravity of 1.529, which makes it more than half again as heavy as air, at the same temperature and pressure. Therefore, methane being lighter than air tends to rise and accumulate at the roof, in mine workings, while carbon dioxide being heavier than air, tends to fall and settle at the floor, or in other low places, unless something prevents.

Buy Supplemental Fuels Now, Says Commissioner Smith; Rush for Hard Coal Would Boost Prices

BY PAUL WOOTON

Washington Correspondent of Coal Age

NOTE—The following article was written before the anthracite wage negotiations were suspended. When the action of the conferees became known a member of the Coal Commission was acquainted with the contents of this article. He stated that while the termination of the conference may be regarded as adding somewhat to the possibility of an ultimate failure in the negotiations, there is no reason to revise the opinions held before the conference broke up and which are reflected herein.

The Coal Commission apparently is taking it for granted that there will be no failure on the part of the anthracite operators and mine workers to reach an agreement. The members of the Commission returned to Washington last week after a few days' breathing spell, and began to concentrate their entire attention on the bituminous situation. While the comment of members of the Commission indicates that they are watching the anthracite situation closely, it is evident that they are not greatly disturbed by the maneuvering in progress at Atlantic City and Scranton. Chairman Hammond admitted at the press conference July 27 that the discussions are passing through the stereotyped stages of all such negotiations. The necessary preliminary sparring is following the usual course, but Mr. Hammond expressed the belief that the contestants are warming up to the point where they are ready to take off the gloves and go to it with bare fists in real earnest, with the prospects favoring a prompt decision.

ASKS FAITH IN INDUSTRY'S RESPONSIBILITY

In its attitude toward the anthracite negotiations it is apparent that the Commission is living up to the policy outlined in its own report. It is throwing the responsibility on the men in the industry. It has called upon the country to have faith in their ability to conduct their own industry in the public interest, and it is evident that the Commission's faith in the ability of these men to work out their own problems has not been shaken. If by any chance the time should arrive when there should be serious doubt as to their ability to agree it is probable that the Commission would do as it did during the bituminous negotiations, and exert its full influence to insist upon an agreement. In fact, Chairman Hammond stated at Friday's conference that the Commission would reiterate its appeal should the occasion arise and in the interest of the public would make that appeal just as strong as possible. He emphasized, however, that there is no thought of taking such a step yet.

While members of the Commission regard it as entirely natural that New England should be worrying over its winter fuel supply, the opinion seems to be that there is nothing to justify the degree of alarm which seems to have pervaded those states. In New England, at least, it was suggested, the interest is centering on the check which must be given the coal dealer rather than on the check-off. The inference intended was that the price of anthracite had reached the point in New England where a considerable proportion of the population cannot afford to pay it. They are not so much interested in the technical differences which are being discussed at Atlantic City as they are in seeing a reduction from \$16 or \$18 per 2,000-lb. ton which they now are being called upon to pay.

Attention was called at the conference to the almost unanimous editorial support which has been given the Commission's position that anthracite is "affected by a public interest." The comment made in that connection led to the warning that a different situation exists with regard to bituminous coal. In contrast with the natural monopoly in anthracite, attention was called to the fact that outside of New England every state either has coal within its boundaries or is contiguous to a coal-producing state. The Commission is rather proud of the fact that three of its suggestions were acted on immediately. The Interstate

Commerce Commission ordered the investigation of anthracite freight rates. The 12-hour shift is to be abolished and a continuing umpire is to sit with the Conciliation Board. Many persons in communications sent direct to the Commission express their opinions of the report. Up to this time a more or less equal division has been maintained between those who think the report too radical and those who think it too conservative.

At least one member of the Commission, Dr. George Otis Smith, believes that little is to be gained by urging householders to buy anthracite at this time. The possibility of a strike has stimulated buying to the point where it is increasing price levels materially. Any rush to buy domestic sizes of anthracite at this time simply would push the price higher. It is sounder advice, he believes, to buy supplemental fuels at this time. These substitutes can be purchased now at the lowest prices which have been obtainable this year. If there should be a strike on Sept. 1, these substitutes would have to be purchased at an advanced price. If there is no strike, it apparently is Dr. Smith's thought that anthracite retail prices would be likely to recede. A two-months supply of coke, briquets, buckwheat anthracite or soft coal would be worth the investment by way of insurance, to say nothing of the possible saving which would be made in the purchase of domestic sizes during a time when there is no semblance of a buying panic.

Chairman Hammond fully expects Congress to provide the legislation recommended in the anthracite report. He believes it is so obviously in the public interest that there will be no important opposition to it. He was asked if, in case of a deadlock, the President were to take over the mines under emergency power, the mine workers would be any more likely to return to work at the request of the President than they would at the request of the private operators? Mr. Hammond, in reply, expressed the opinion that the probabilities of their return would be increased, but even if they were not, such action on the part of the government would bring to bear on the situation the full weight of public opinion, which would be likely to get results.

The Coal Commission had planned to issue this week a report on civil liberties, but on Monday the bituminous operators announced to the Commission their intention of filing a special brief on the West Virginia situation. At their request the Commission is withholding the report until the brief can be received and examined.

Brydon Names Policy Committee of 25 To Continue Study of Coal Problems

John C. Brydon, president of the National Coal Association, on Aug. 1, named twenty-five of the country's foremost operators of bituminous-coal mines as members of a committee whose purpose it shall be to continue the study of problems confronting the industry, to pass on questions of policy affecting the association and to form a closer liaison between the mine owners and the public.

This committee is to be known as the Policy Committee of the association, a new body formed as the result of a suggestion embodied in the inaugural address of Mr. Brydon when he was elected president of the organization at its recent annual meeting in Atlantic City. In selecting its members the association's president chose not only with a view to giving the industry adequate geographical representation but the personnel is equally divided among owners of mines employing union labor and those conducted under the open-shop system. By virtue of his office Mr. Brydon will be chairman of the committee.

"We must organize to put ourselves regularly and con-

tinuously into closer contact with the public's interest and the public's mind," Mr. Brydon declared. "In my opinion," he continued, "the action taken by the membership of the National Coal Association in authorizing the appointment of a Policy Committee, is the most advanced step we have taken. It means that the members of the association have recognized and are ready voluntarily to assume the obligations which belong to a great industry."

"The membership of the Policy Committee is not confined to the National Coal Association," Mr. Brydon explained. "In making up the committee, counsel and advice have been sought beyond as well as within the association. This has resulted in a committee membership which is truly representative of the industry as a whole."

"For example, the entire membership of the Bituminous Operators' Special Committee, which was not confined to the association, is included in the Policy Committee. The Special Committee has for some months been making a careful exhaustive and intensive study of the soft-coal industry in co-operation with the U. S. Coal Commission. The Policy Committee will benefit by the inclusion of all Special Committee members, who, because of their activities in the investigation now in progress, are among the best informed men on the general situation of the bituminous industry."

"I am confident that the work of the Policy Committee of the National Coal Association will be an important factor in producing results both for the public and the industry itself."

Hoover's Book on Trade Associations Wins Attention in Coal Industry

There is a widely held belief throughout the country that the exhaustive study of trade associations just completed by the Department of Commerce and the publication of the department's book on the subject—"Trade Association Activities"—is going to do much to establish effective associations within the coal industry. The book was issued July 16. It is now in demand and is getting studios attention throughout the industry. Expressions from coal men indicate that they think the book is not only helpful, being the first comprehensive work on the subject, but that its aim is right and that it may unify the several confusing governmental attitudes toward trade associations.

The book comprises an introduction by Secretary Hoover, chapters compiled from the experience of many on statistics, legislative activities, cost accounting, credits, trade disputes and ethics, employee relations, insurance, public relations, traffic, research, and other phases of trade association work, together with a study of association organization, a history of associations and a directory of national and international associations. Altogether it is a 368-page volume that attempts to cover the whole subject, but, as the editors of it say: "Manifestly it has been impossible to collect the matured views of all those qualified by knowledge and experience to give worth-while information," so they will welcome criticisms and suggestions that may make future editions of the book more valuable.

In his introduction, Mr. Hoover, recognizing that the public has gained a warped idea of associations because of "the minority of activities which have been used as a cloak for action against the public interest," declares the business of this country needs the constructive work that associations can best do and that therefore the public should get a clearer and truer idea of associations. The book was published, he says, not to educate big business but to show that legitimate trade associations and other forms of business co-operation are the real basis for promotion of small businesses. Mr. Hoover declares the proper collection and dissemination of business statistics benefits both the producer and consumer and is so necessary to the orderly economic life of the country that statistical services must be maintained either by associations or by the government. All the way through his introduction Mr. Hoover makes it plain that legitimate trade associations are essential and the book outlines, chapter by chapter, what legitimate associations can do.

The chapter on the legal aspects of the trade association situation is of particular interest since it comes from Nelson B. Gaskill, of the Federal Trade Commission. It has been assumed that the Federal Trade Commission is not particularly friendly to the movement.

In his chapter Mr. Gaskill says, among other things: "The trade association is not a combination in restraint of trade with one hand tied. It is not a medium for the exchange of business secrets for the sole benefit of those who join in the exchange. It is not a new arrangement for the accomplishment of any object which needs, because of the law, to be pursued stealthily and in the dark. It is an expression of an interest, common to all in any industry in which it arises, seeking to benefit the individual by bettering the entire industry and the public which the industry serves."

"It serves where the individual acts. It instructs where the individual learns. It works for the individual, but never instead of him. And while the attention of the individual may be focused on himself and his own interest, the aims, objects and ideals of the trade association are fixed in the wider field of the welfare of the whole group, the whole industry and the whole public dependent upon it." Mr. Gaskill concludes, however, with the admonition that the trade association must "hitch its wagon to a star."

Kansas Fails to Get a Machine Scale

The latest effort to get a machine mining scale for Kansas has failed. Conferences between the Southwestern Interstate Coal Operators' Association and the United Mine Workers of District 14 in Kansas City at intervals since last March 19 were broken off June 20 at a final session which lasted three days. A gap of 5c. divided the operators and miners when negotiations ceased. The operators, who had at first proposed that the machine scale be 15c. a ton less than the \$1.25 paid for digging, later offered an 11c. differential, but the miners' union would make no concession from its demand that the differential be only 6c.

A statement issued by the operators' association at the termination of negotiations said that machine equipment for each mine would cost \$12,000 to \$15,000; that the saving in powder purchases by the miners and lightening of the work would have justified a 15c. differential and that the 11c. differential would not fully cover the investment, installation and maintenance, and that therefore a still lower differential as demanded by the miners could not be considered.

The operators' statement, issued by W. L. A. Johnson, general commissioner, said: "It is very regrettable that the miners saw fit to break off negotiations, as it withdraws the ray of hope that the Kansas mining field would be given an opportunity to recover much of its lost market by being able to offer a larger volume of prepared lump coal at reduced cost, which would have enabled some reduction in prices and the maintenance of its market and the extension of the same to a wider field, thus enabling the miner to make greater earnings and have steadier work instead of having 200 or 300 'no-bill' cars on the track and only one to three days' working time a week."

An offer of the operators to arbitrate the differential with a representative of the international board of the United Mine Workers or a committee from that body was refused by the union conferees.

Cutting machines of various kinds have been used experimentally in the Southwest for about a year in the hope that by this time a scale would be worked out, so that by next fall the entire field could be on a machine basis. Several of these have been uniformly successful. In the Cherokee region even in an upper vein only 20 to 24 ins. thick a number of machines have been worked by operators who received the union day scale of \$7.50. Near Pleasanton approximately 15 machines have been working on a combination tonnage and day rate.

In the whole of District 14 the coal has been shot so hard that slack has averaged between 50 and 55 per cent of the total output. This naturally has been a tremendous handicap to the operators. Their hope has been to reduce the slack percentage to at least 40 and be able to produce cleaner coal with much less powder after cutters were installed.

Anthracite Wage Conference Breaks Up When Operators Balk at Granting "Check Off"

Refusal of the anthracite mine operators to grant the demand of the mine workers' leaders for the "check off" broke up the wage conferences at Atlantic City on July 27. The conference was nearly disrupted the day previous when John L. Lewis demanded that the operators grant demand No. 1, which covers complete recognition of the union and the "check off" as a condition of continuing the conferences. Part of two sessions had been devoted to a discussion of the demand when Mr. Lewis presented a motion "that the principle of complete recognition and the check off as explained in demand No. 1 be adopted." The operators voted "No" and the miners "Aye," S. D. Warriner, chairman of the sub-scale committee, declaring the motion lost.

Mr. Lewis said the miners insisted upon this demand and an adjournment was taken until the following day.

Before final adjournment was taken on July 27, Mr. Warriner read a statement setting forth the position of the operators and making an offer to submit the questions at issue to arbitration. This was refused by the miners.

AGREEMENT CONTINGENT ON UNION RECOGNITION

At the conclusion of the conference on July 26 Mr. Lewis said that the making of a new anthracite working agreement is contingent upon the anthracite operators giving full recognition to the United Mine Workers of America.

"Such relationship has existed for a quarter of a century in the bituminous coal fields," said Mr. Lewis, "and the miners are within their rights in asking recognition from the anthracite operators. This demand for recognition will not add a single penny to the cost of the anthracite product, and concession on this point is essential to carry out the recommendations of the U. S. Coal Commission in the matter of penalties for breach of contract. The mine workers are consistent on this point and will continue in that attitude."

S. D. Warriner, replying for the operators, said that they do and have fully recognized the union as a contracting party in accordance with the provisions laid down in the Roosevelt award in 1903 and the award of President Wilson's commission in 1920.

Continuing he said, "Their officers and agents are recognized people with whom we do business and confer to settle disputes and grievances relative to labor matters in the anthracite region."

"This agreement to which the union has heretofore subscribed, has been on the open shop basis, under which anyone can work in the anthracite field in accordance with his constitutional rights so to do. If he elects to become a member of the union he is protected against any discrimination by any employer."

"The recognition insisted upon by Mr. Lewis is on the closed-shop proposition, under which no one can work in the anthracite fields unless he is a member of the organization, thereby depriving anybody who may not so elect of his constitutional rights to earn his living at his chosen vocation."

"The operator also is to be compelled to collect from every man working in the anthracite industry, exclusive of clerical and managerial occupations, such fines, dues and assessments as the union may dictate."

"The U. S. Coal Commission of 1923 is very clear on this matter when it says: 'The principle that a man has the legal right to work free and unimpeded by threats, duress, coercion or restraint, when, where and for whomsoever he chooses; that a man has a legal right to employ and discharge as he pleases, and that men have a right to bind themselves together for collective bargaining, touching wages and working conditions, are freely admitted by every one. These principles honestly lived up to would keep the open shop and at the same time permit the existence of the union.'"

"To all intents and purposes the agreement under which we are operating is in accordance with these principles."

When the conference was resumed on July 27 Mr. Warriner, after Mr. Lewis had declared that the miners still insisted upon demand No. 1, read into the record a statement setting forth the attitude of the operators, and concluding with an order to arbitrate. Mr. Lewis in replying to Mr. Warriner stated that negotiations could not go on until concession had been made on the matter of the recognition of the union and the installation of the check off. Mr. Warriner's statement read in part:

"You make a condition of further negotiation the acceptance by the operators of your first demand—complete recognition of the United Mine Workers of America, which you very frankly tell us implies the closed shop and the check off. In a word, you say to us that unless we are willing to make membership in your organization a condition of employment, and unless we are willing to collect from the pay envelopes of our employees union dues, assessments and fines arbitrarily levied upon your members, and turn the moneys over to the treasurer of your organization, you must refuse further consideration of a contract to take effect after the expiration of the present contract on Aug. 31."

"As far as the recognition of your organization is concerned, you have such recognition now, for the present contract is with the United Mine Workers of America."

"The demand for a closed shop has twice been a subject of arbitration between us—first before the Roosevelt commission in 1902, and second before the Wilson commission of 1920."

UNION SUBORDINATE TO LAWS OF NATION

"Both of these commissions refused your demands in no uncertain terms and declared unequivocally for the open shop. You seem to ignore entirely the admonition of the Roosevelt commission that 'the trade union is a voluntary social organization and like any other organization is subordinate to the laws of the land and cannot make rules or regulations in contravention thereof. Yet at times it seeks to set itself up as a separate and distinct governing agency and to control those who have refused to join its ranks and to consent to its government, and to deny to them the personal liberties which are guaranteed to every citizen by the Constitution and the laws of the land.'"

"In the final analysis nothing could express our view more clearly than the quotation just given."

"It is to be regretted that your position prevents further negotiation and the working out of a new contract by the orderly process of collective bargaining. Therefore, I would like to state definitely the position of the operators."

"We have listened to the arguments you have presented covering the demand just refused, the demand for a general increase in wages, and the other demands, which in the main were a repetition of demands before the Wilson commission in 1920. The industry is operating under a scale of wages which represents the very peak of post-war conditions. The employees in our industry have not suffered a wage reduction and wages today are far above the increase in the cost of living as compared to the pre-war period. The report of the U. S. Coal Commission, just issued, indicates most clearly adequate earnings to permit the essential so far as reasonable standard of living."

"In the light of these conditions we are prepared to execute a contract renewing the present wage scale to April 1, 1925. We will eliminate the twelve-hour day where it is in effect, speed up the work of the Board of Conciliation, and endeavor to embody in the contract clauses covering those minor matters which we have expressed a willingness to consider during the present negotiations."

Mr. Lewis replied extemporaneously at some length to Mr. Warriner's statement, charging it "obviously was prepared for the press, for public consumption."

He declared the quotation from the Roosevelt commission's award was "utterly unfair and unjust," saying the union was "a legal and an American organization recog-

nizing the majesty of the law and the sovereignty of our Republic, and there is no conflict in principle or in fact between any of our demands and the laws of our country or the public welfare."

In demanding "complete recognition" Mr. Lewis said the anthracite men were only asking for that form of human relationship which had obtained in the bituminous industry for twenty-five years. They wanted only a contract with the operators that would be "a formal and complete recognition of the mutual responsibilities by both parties thereto." Continuing, he said:

"The operators' attempt to base their refusal upon the abstract theories enunciated in the report of the commission in 1903 is merely a subterfuge to enable them to evade their responsibilities. The world is not governed by the hoary traditions of the past and the mining industry is no longer bound by the conditions of two decades ago.

"The opinions of men of twenty years ago, of no particular experience in the mining industry, when the trade relationship between the operators and the miners had been of brief duration, are of no particular consequence today. It does not follow that their judgment must forever prevail, despite the onward progress of the world and the changing conditions of the twentieth century."

At the session on July 25 an agreement was reached on demand No. 10, in which the miners asked that mine committees and company officials be authorized to agree upon wage rates for new work and file these rates with the Board of Conciliation.

Bituminous Operators' Committee Attacks Check Off as Inimical to Industry

In a statement issued at Atlantic City, Saturday July 28, the Special Committee of Bituminous Coal Operators challenged the statement of the United Mine Workers that the "check off" has been found a satisfactory arrangement by the soft coal operators. The committee was in session there preparatory to meeting the Coal Commission in Washington on Monday, July 30. The statement follows:

"The anthracite conference has broken down on the insistence of the United Mine Workers for the check off. Mr. Lewis proposes to cut off the supply of anthracite coal to the public on the single issue that the operators will not consent to collect forcibly for his organization dues and assessments from every mine worker in the anthracite fields. That is what the check off means. He appeals to the public for justification of his position on the ground that the check off is a regular feature of the union contract and has worked to the satisfaction of everybody in the bituminous fields.

"No statement could be farther from the truth. On the contrary, the check off has proved so inimical to the steady and peaceful production of bituminous coal that the Bituminous Operators' Special Committee has filed a formal request with the U. S. Coal Commission for the complete abolition of the system.

"The check off is contrary both to the principles of Americanism and of unionism. Under it the central power of the United Mine Workers at Indianapolis is able to wring payment from every worker in the unionized fields, whether he wants to pay or not, for purposes of which he never had a chance to express an opinion and of which he may entirely disapprove. It is taxation without representation, the most un-American system conceivable.

"So far as unionism is concerned the check-off is used in practically no other union American industry. It is a unique weapon of enforced taxation, and insisted on by the United Mine Workers alone. The great self-respecting unions of the country are able to command sufficient confidence among their members to collect their own dues without this artificial means. Even among the miners of Great Britain, who have been unionized for generations, the check off does not exist and would not be tolerated for a moment.

"Collections of dues and assessments for the United Mine Workers' organization by the operators is no part of 'recognition' of the union. No unions could be more fully 'recognized' than the great railroad unions in this country and

the mine workers' union in England. Neither of them has such a check-off.

"Under the check off the United Mine Workers raise every year more than seventeen million dollars. From this huge sum they paid the expenses of armed invasion of West Virginia in 1921 by 12,000 men, an invasion which had to be suppressed by federal troops. By it they recently raised \$900,000 in Illinois to defeat justice against the Herrin murderers. It feeds a fund which every man who commits an act of violence in aid of this organization throughout the country knows will be at his command to help him to escape punishment for his act.

LEGALITY OF CHECK OFF BEFORE COURTS

"The check off is now under attack in the federal courts on the ground of the illegality of the use to which it is being put.

"This system was originally accepted in the bituminous industry in the hope that it would tend to lessen strife and breaches of agreement. The result has been just the opposite. Strife and breaches of agreement have very greatly increased throughout all the unionized fields since the check off was adopted.

"So long as the leaders of the United Mine Workers can command the use of this method of acquired, irresistible power against the community and justice, it is not surprising that they should refuse to submit the controversy to the peaceful solution of arbitration. Their present refusal, backed by Mr. Lewis, to stand for arbitration in any form is directly connected with this iniquitous system.

"The experience of the bituminous industry in the check off has absolutely demonstrated the far-sightedness and wisdom of President Roosevelt's commission in 1902 and President Wilson's commission in 1920 in refusing to impose this system upon the anthracite industry."

John L. Lewis at once replied, stating:

"The statement of the so-called Special Committee of Bituminous Operators attacking the 'check-off' system prevailing throughout the bituminous industry is merely propaganda in behalf of the non-union coal operators who dominate the National Coal Association. These interests are bitterly opposed to the principle of collective bargaining. In denying the principle of collective bargaining they set aside and trample upon a recognized principle of human and industrial relationship and turn backward the clock of progress.

"The non-union members of the National Coal Association are not as bitterly opposed to the 'check off' as they would have the public believe. They daily apply the 'check-off' system in deducting from the wages of their employees moneys for payment of store bills from their swindling company stores, doctors' fees, blacksmithing, house rent, house coal, tools, fuse, mining supplies, taxes and funds for the maintenance of baseball clubs, etc.

"They prevaricate when they state that the United Mine Workers forcibly compel them to contribute to the organization. The miners only ask that the 'check off' in the anthracite region, as elsewhere, operate in behalf of members of the United Mine Workers when they file individual orders constituting a legal assignment with the coal operators for their monthly dues to be deducted."

ABOLITION OF CHECK OFF MAY MEAN STRIKE

On Monday Mr. Lewis again attacked the National Coal Association, charging that it is dominated by non-union interests who seek to destroy the union. He said that any attempt on the part of the bituminous operators to abolish the "check off" would precipitate a national coal strike and asserted that this is just what the non-union operators are seeking in order that they may have the entire coal market to themselves and charge the public high prices.

John Brydon president of the National Coal Association, took issue with Mr. Lewis, asserting that that association represents 60 per cent of the tonnage produced in the union fields and about 40 per cent in the non-union fields. He also announced that the special committee will render a full account of its expenditures to the U. S. Coal Commission and suggested that Mr. Lewis also file an account with the Coal Commission of the disbursements of money obtained by the union through the "check off."

Bituminous Operators Offer Government a Plan to Supply Nation's Fuel in Event of Anthracite Strike

The Special Committee of Bituminous Coal Operators, headed by John Brydon, president of the National Coal Association, spent Monday, July 30, in executive session with the U. S. Coal Commission. The purpose of the conference was to present to the Coal Commission the statement of suggested finding of fact on which it is hoped by the operators that agreement can be reached with the Commission, thereby limiting further efforts on the part of both to a comparatively few controverted matters.

Following the conference the operators issued two statements, one to the press and one to the Commission, transmitting formally the statement of Mr. Brydon on Saturday replying to the claim of the mine workers that the "check-off" is a satisfactory arrangement with the soft-coal operators now in process of formation by the National Coal Association to handle distribution of coal during national emergencies. He stated that this machinery can be perfected in two weeks and offered it to the government in the event that an emergency be caused by a strike in the anthracite region next month.

Mr. Brydon also offered on behalf of the bituminous-coal operators of the country to organize with the proper department of the government a plan for voluntary publicity "of the facts as to costs and earnings of the industry and the wage earnings of miners and other vital information concerning the industry; this information to be compiled and published in such a way as not to reveal to competitors the facts as to particular companies."

The entire soft-coal output of the country excepting only 40,000,000 tons was represented in person before the Com-

missioner on Monday, according to the statement issued by the operators. The missing tonnage is mined west of the Mississippi and only distance kept their representatives from attending, Mr. Brydon said. Iowa is the only field not represented. The union operators who appeared in person before the Commission included A. M. Ogle, Indiana; George B. Harrington, Illinois; Michael Gallagher, Ohio; T. W. Guthrie, B. M. Clark, Charles O'Neill, David Price, W. A. Jones, and T. E. Clarke, Pennsylvania. The non-union operators were Mr. Brydon, Pennsylvania; E. L. Greever, Virginia; E. L. Douglas, Kentucky; S. L. Yerkes, Alabama, and W. H. Cunningham, West Virginia.

Discussing proposals of the operators to the Commission, Mr. Brydon said "This emergency plan is purely voluntary, and as president of the National Coal Association, and thus representing the great majority of the bituminous operators of the United States, I give assurance that the needs of the public will be met and the operation of this emergency distribution machinery will not be open to the criticism of any department of the government. Of course, at this time emergency machinery is being set up to handle any situation, if perchance there should be a suspension in anthracite production. However, the plan is so broad in scope and so practical that it can be used to serve the government and the public under any emergency.

"Good faith in carrying out this plan will require the prices to be reasonable, and that the public may know the prices are reasonable fullest publicity will be given through a central agency of such facts as are necessary to enable the public to reach an intelligent conclusion thereon."

Blizzard Jury Disagrees and Is Discharged

After a trial lasting from June 18 until July 26 the jury in the case of William Blizzard, president of sub-district 2 of District 17, United Mine Workers, reported to Judge Sharp, of the Circuit Court of Greenbrier County, at Lewisburg, W. Va., that they were unable to agree, and were discharged. Blizzard was charged jointly with C. F. Keeney, president of District 17, and Fred Mooney, secretary of that district, with being accessory to the murder of George Munsy, a Logan County deputy sheriff in conjunction with the armed march of 1921.

As soon as the disagreement had been reported and the jury had been discharged, it was announced by Prosecuting Attorney S. M. Autin, of Greenbrier County that Blizzard would be retried.

Kansas Industrial Court Starts Coal Investigation of its Own

An investigation of contracts between the Jackson-Walker Coal & Mining Co. and firms holding leases from the company in the southeastern Kansas field has been ordered by the Kansas Industrial Court. The investigation will start Aug. 13, on a complaint filed by the Industrial Court on its own motion, charging violation of the Industrial Court law and alleged restraint of trade. It entails a possibility of prosecution under the anti-trust law, it has been announced in Topeka.

Seventeen firms with a total investment of approximately one-half million dollars and employing 1,200 miners, are made defendants with the Jackson-Walker company. These firms lease from Jackson Walker, who, in turn lease from the Cherokee & Pittsburg Coal & Mining Co., which in turn leased the coal lands from the Santa Fe R.R. when the control of coal fields by railroads was prohibited by Congress.

It is charged that the leases under which the seventeen companies operate require the sale of all coal produced by them to Jackson Walker, with the provision, however, that they may sell coal in the open market by paying Jackson Walker a royalty of 40c. a ton. Under this provision the

lessees declare, they are unable to meet prices in the open market. They also assert that during the summer the acceptances by Jackson Walker have been so meager that they have found it impossible to operate profitably.

Effective Date of Assigned-Car Order Deferred One Month to Oct. 1

So much pressure has been exerted on the Interstate Commerce Commission by the railroads and private-car owners for a rehearing on the assigned-car and private-car decision that on July 25 the Commission deferred the effective date of the order from Sept. 1 to Oct. 1. This is generally interpreted to mean that the case will be reopened although some believe that no decision has been reached on this and will not be until a number of the commissioners who are out of Washington shall have returned.

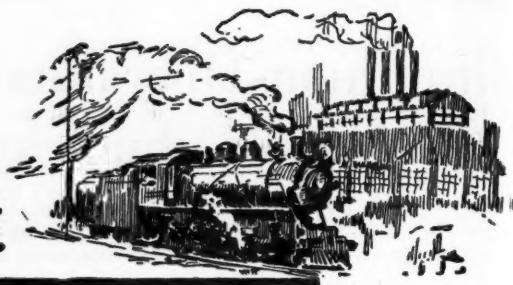
Petitions for a rehearing and argument have been filed by the Seaboard By-product, Chicago By-product, Donner-Union, and Rainey Wood Coke companies, the Cleveland Cliffs Iron Co., the Steel Co. of Canada, the Berwind-White, Westmoreland, New River and Pocahontas Consolidated and Pennsylvania Coal & Coke companies, the Pittsburgh Plate Glass Co., the Chesapeake & Ohio R.R., the United States Steel Corporation, the Public Service Electric Co. and the American Railway Association.

The Central Pennsylvania Coal Producers' Association has answered these petitions and asked that they be denied. It is understood that the National Coal Association will file a similar answer to the petition of the railroads.

THE INTERSTATE COMMERCE COMMISSION has affirmed its original findings in the case of the Hillsboro company versus the Big Four. A re-argument had been allowed in the case. In the original decision the commission held that the failure of the Big Four to make arrangements whereby the Hillsboro company would be able to avail itself of the facilities and rates of the Chicago & Eastern Illinois R.R. did not result in undue prejudice and disadvantage to the coal company. The points involved in this case are now before the Supreme Court of the United States for decision.



Production and the Market



Weekly Review

Abrupt breaking off of the wage conferences at Atlantic City on July 27 has not yet aroused consumers of hard coal to a fear they will be without fuel next winter. Producers of bituminous domestic coals, which were used to advantage by many consumers during the last shortage of hard coal, are receiving inquiries. Operators in the Broadtop district producing egg, stove and nut sizes, are sold ahead for the next few weeks. The inquiry for substitutes also has extended to coke. Quotations for independent domestic sizes of hard coal took another jump last week, some of the smaller operators and shippers quoting from \$12.75 to \$13.00 for egg, stove and nut coals, concessions being made when a proportionate share of the smaller sizes or bituminous coal is taken.

Consumers of bituminous coal are being urged by producers to heed the warnings issued from Washington to put in coal in anticipation of autumn and winter requirements. This has resulted in additional inquiry and some actual orders, although the improvement is scarcely noticeable. A survey of storage piles at industrial plants in various sections of the East shows that stocks are fairly good, with some concerns adding to the supplies already on hand.

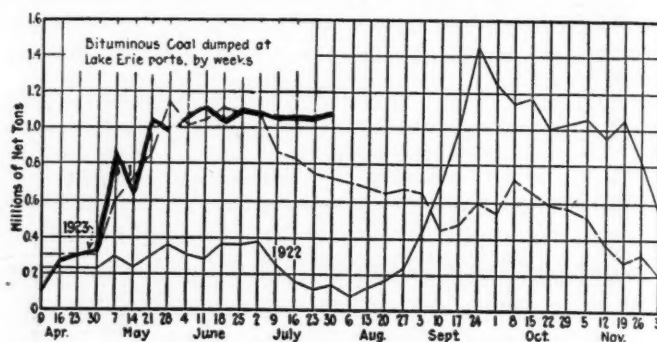
RESERVE STOCKS PROBABLY GROWING

Output of bituminous coal continues at an average of about 10,750,000 net tons weekly and while the tabulated returns of a canvass of reserve storage piles as of July 1 has not been completed, the Geological Survey says it seems evident that unless the rate of consumption increased greatly in June, production was sufficient to permit appreciable additions to the 40,000,000 net tons on hand as of June 1.

For three weeks the price of soft coal has remained almost stationary. *Coal Age* Index dropped one point on July 30 to 197, corresponding to an average price of \$2.37 f.o.b. mines. Declines occurred in Springfield

and southern Illinois, western Kentucky, Hocking, eastern Ohio and Pocahontas coals with increases in eastern Kentucky and Kanawha.

There are faint signs in the Middle West that the end of the summer slump is approaching. The better feeling followed a pick up in buying of domestic coals in the Northwest. Consumption in New England is much less than expected, and some large consumers are endeavoring to hold off contract shipments. There is some anxiety over the possibility of a suspension of mining in the anthracite fields, but the public does not act favor-



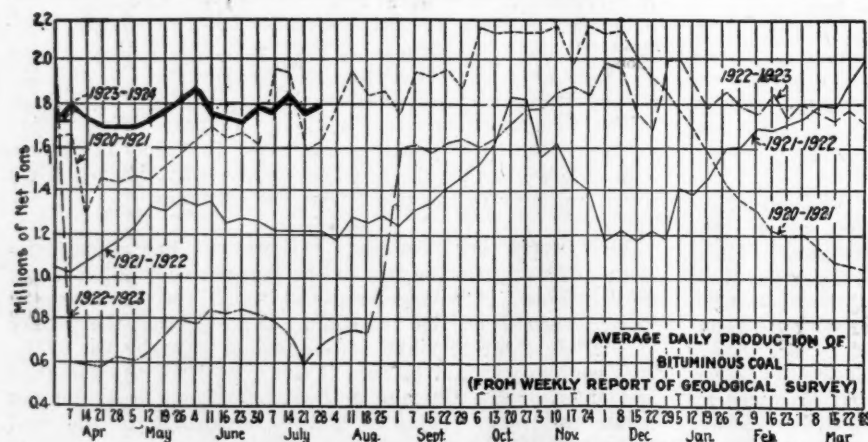
LAKE COAL DUMPED

(Net Tons)

	Week Ended July 30	Season to July 30
Cargo	1,067,202	12,885,151
Fuel	55,027	644,429
Total	1,122,249	13,529,580

ably on the suggestion that they use substitutes for the hard coals.

Export demand is quiet. There were few inquiries during the week according to New York houses those that were received coming from Italy and Holland. At Baltimore there was a drop in shipments to European countries, but an increase in movement to Canada.



Estimates of Production

(Net Tons)

BITUMINOUS

	1922	1923
July 7.....	3,678,000	8,742,000
July 14.....	4,123,000	10,941,000
July 21.....	3,692,000	10,673,000
Daily average.....	615,000	1,779,000
Calendar year.....	199,343,000	303,628,000
Daily av. cal. year.....	1,162,000	1,775,000

ANTHRACITE

July 7.....	23,000	1,580,000
July 14.....	32,000	2,051,000
July 21.....	28,000	2,005,000
Calendar year.....	23,408,000	56,805,000

COKE

July 14 (b).....	100,000	376,000
July 21 (a).....	104,000	360,000
Calendar year.....	3,515,000	11,182,000

(a) Subject to revision. (b) Revised from last report

During the first three weeks in July twenty-three ships leaving Baltimore carried in cargo and bunkers 195,586 tons of coal, while for the corresponding period of June thirty-one ships leaving the same port carried 222,012 tons of coal in cargo and bunkers.

Dumpings of coals for all accounts at Hampton Roads during the week ended July 26 were 392,249 net tons, as compared with 357,979 net tons the previous week.

With orders increasing and many miners in the smaller operations taking "vacations" some independent producers of anthracite are refusing to book additional orders at this time. Complaints of curtailed production are heard in some of the smaller mines, due to scarcity of labor on account of the vacation period and the subsequent inability of the operators to fill outstanding orders.

Midwest Is Hopeful Now

Signs marking the approaching end of the summer slump in coal are appearing faintly here and there throughout the Midwest region. They come mostly from the Northwest,

which is beginning to buy a little more domestic. However, even this small upturn has had little effect upon the down-right summer slump. No other activity worth the name has developed either in the domestic or industrial trade. Southern Illinois screenings, even though about cleaned up, do not strengthen. Most of them move at \$1.50 with an occasional car at \$1.60@1.65.

Railroads are now through stocking. A few small shipments at bargain prices will still sell to certain roads, but the storage trade that has kept a number of mines busy during the summer, is over. With domestic business still bumping bottom, there remains little to keep Illinois and Indiana mines running except contract business. Even the anthracite strike talk has not excited the Midwest region into ordering soft coal. Only a little hurrying of anthracite and smokeless lump and egg trade is noticeable.

St. Louis Remains Lifeless

St. Louis business continues stagnant. There is little interest even in anthracite. Plenty of coke is available and a little Arkansas comes in steadily. Dealers expect the first week in August to mark the turn. Steam trade in the city and surrounding country amounts to nothing.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	July 31, 1922	July 16, 1923	July 23, 1923	July 30, 1923†
Smokeless lump.....	Columbus....	\$8.50	\$6.00	\$6.00	\$5.75@	\$6.00
Smokeless mine run.....	Columbus....	8.15	3.25	3.25	2.75@	3.25
Smokeless screenings.....	Columbus....	8.00	2.90	2.90	2.65@	3.00
Smokeless lump.....	Chicago....	8.10	6.10	6.10	6.00@	6.25
Smokeless mine run.....	Chicago....	8.10	3.60	3.60	3.25@	4.00
Smokeless lump.....	Cincinnati....	5.90	6.00	6.00	5.50@	6.00
Smokeless mine run.....	Cincinnati....	5.50	3.35	3.35	3.00@	3.75
Smokeless screenings.....	Cincinnati....	5.15	3.00	3.00	2.50@	3.50
*Smokeless mine run.....	Boston....	8.15	5.35	5.60	5.35@	5.60
Clearfield mine run.....	Boston....	6.00	2.35	2.35	2.00@	2.75
Cambria mine run.....	Boston....	6.65	2.85	2.85	2.50@	3.25
Somerset mine run.....	Boston....	6.00	2.60	2.60	2.25@	3.00
Pool 1 (Navy Standard).....	New York....	.....	3.50	3.35	3.25@	3.50
Pool 1 (Navy Standard).....	Philadelphia....	.....	3.60	3.50	3.20@	3.70
Pool 1 (Navy Standard).....	Baltimore....	.....	.....	.....	.....	.....
Pool 9 (Super. Low Vol.).....	New York....	.....	2.55	2.65	2.50@	3.00
Pool 9 (Super. Low Vol.).....	Philadelphia....	8.25	2.70	2.65	2.30@	2.90
Pool 9 (Super. Low Vol.).....	Baltimore....	7.25	2.50	2.40	2.35@	2.50
Pool 10 (H.Gr. Low Vol.).....	New York....	.....	2.25	2.25	2.00@	2.50
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....	8.00	2.25	2.25	2.00@	2.35
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	7.25	2.20	2.20	2.20@	2.30
Pool 11 (Low Vol.).....	New York....	7.75	1.85	1.95	1.75@	2.25
Pool 11 (Low Vol.).....	Philadelphia....	8.00	1.85	1.85	1.70@	2.00
Pool 11 (Low Vol.).....	Baltimore....	7.75	2.05	1.95	2.00	.....
High-Volatile, Eastern						
Pool 54-64 (Gas and St.).....	New York....	7.75	1.75	1.75	1.65@	2.00
Pool 54-64 (Gas and St.).....	Philadelphia....	8.15	1.60	1.70	1.70@	1.90
Pool 54-64 (Gas and St.).....	Baltimore....	7.90	1.75	1.70	1.70	.....
Pittsburgh so'd gas.....	Pittsburgh....	.....	2.65	2.65	2.60@	2.75
Pittsburgh mine run (St.).....	Pittsburgh....	.....	1.95	1.95	1.90@	2.00
Pittsburgh slack (Gas).....	Pittsburgh....	.....	1.40	1.45	1.40@	1.50
Kanawha lump.....	Columbus....	8.00	3.00	3.00	2.75@	3.25
Kanawha mine run.....	Columbus....	7.75	1.85	1.85	1.75@	2.00
Kanawha screenings.....	Columbus....	7.75	1.10	1.05	1.00@	1.20
W. Va. lump.....	Cincinnati....	6.40	3.10	2.85	3.00@	3.25
W. Va. Gas mine run.....	Cincinnati....	6.40	1.85	1.50	1.40@	1.75
W. Va. Steam mine run.....	Cincinnati....	6.00	1.85	1.50	1.40@	1.75
W. Va. screenings.....	Cincinnati....	5.90	1.05	1.05	75@	1.00
Hooking lump.....	Columbus....	8.15	2.75	2.75	2.50@	3.00
Hooking mine run.....	Columbus....	7.75	1.85	1.85	1.75@	2.00
Hooking screenings.....	Columbus....	7.75	1.25	1.25	1.10@	1.25
Pitts. No. 8 lump.....	Cleveland....	8.50	2.50	2.55	2.05@	3.00
Pitts. No. 8 mine run.....	Cleveland....	8.50	2.00	1.95	1.75@	1.90
Pitts. No. 8 screenings.....	Cleveland....	8.50	1.30	1.25	1.20@	1.35
Midwest						
Franklin, Ill. lump.....	Chicago....	.....	\$3.90	\$3.65	\$3.00@	\$4.35
Franklin, Ill. mine run.....	Chicago....	.....	3.00	3.00	2.75@	3.00
Franklin, Ill. screenings.....	Chicago....	.....	1.65	1.65	1.50@	1.85
Central, Ill. lump.....	Chicago....	.....	2.60	2.60	2.50@	2.75
Central, Ill. mine run.....	Chicago....	.....	2.10	2.10	2.00@	2.25
Central, Ill. screenings.....	Chicago....	.....	1.55	1.45	1.35@	1.40
Ind. 4th Vein lump.....	Chicago....	.....	3.35	3.35	3.25@	3.50
Ind. 4th Vein mine run.....	Chicago....	.....	2.60	2.60	2.50@	2.75
Ind. 4th Vein screenings.....	Chicago....	.....	1.60	1.60	1.50@	1.75
Ind. 5th Vein lump.....	Chicago....	.....	2.85	2.85	2.75@	3.00
Ind. 5th Vein mine run.....	Chicago....	.....	2.10	2.10	2.00@	2.25
Ind. 5th Vein screenings.....	Chicago....	.....	1.45	1.45	1.40@	1.50
Mt. Olive lump.....	St. Louis....	.....	3.00	3.00	3.00	.....
Mt. Olive mine run.....	St. Louis....	.....	2.00	2.00	2.00	.....
Mt. Olive screenings.....	St. Louis....	.....	1.75	1.75	1.75	.....
Standard lump.....	St. Louis....	.....	2.35	2.55	2.40@	2.75
Standard mine run.....	St. Louis....	.....	1.85	1.85	1.85	.....
Standard screenings.....	St. Louis....	.....	1.20	90	.85@	1.00
West Ky. lump.....	Louisville....	.....	7.25	2.30	2.15	2.15@ 2.35
West Ky. mine run.....	Louisville....	.....	7.25	1.70	1.70	1.35@ 1.85
West Ky. screenings.....	Louisville....	.....	7.25	1.20	1.05	.85@ 1.25
West Ky. lump.....	Chicago....	.....	7.60	2.40	2.10	2.00@ 2.25
West Ky. mine run.....	Chicago....	.....	7.60	1.15	.95	.90@ 1.00
South and Southwest						
Big Seam lump.....	Birmingham..	4.50	3.25	3.25	3.15@	3.40
Big Seam mine run.....	Birmingham..	4.50	1.95	1.95	1.75@	2.15
Big Seam (washed).....	Birmingham..	4.50	2.35	2.35	2.25@	2.50
S. E. Ky. lump.....	Chicago....	8.00	2.85	2.85	2.75@	3.00
S. E. Ky. mine run.....	Chicago....	8.00	2.10	2.10	2.00@	2.25
S. E. Ky. lump.....	Louisville....	7.75	2.85	2.70	2.85@	3.00
S. E. Ky. mine run.....	Louisville....	7.75	2.00	1.75	1.50@	2.00
S. E. Ky. screenings.....	Louisville....	7.60	1.05	1.00	.75@	1.25
S. E. Ky. lump.....	Cincinnati....	7.75	3.10	3.00	3.00@	3.25
S. E. Ky. mine run.....	Cincinnati....	6.00	1.85	1.50	1.40@	1.75
S. E. Ky. screenings.....	Cincinnati....	5.90	1.00	90	.75@	1.00
Kansas lump.....	Kansas City..	5.00	4.00	4.00	3.50@	4.50
Kansas mine run.....	Kansas City..	4.75	3.25	3.25	3.00@	3.50
Kansas screenings.....	Kansas City..	4.25	2.60	2.60	2.50@	2.75

* Gross tons, f.o.b. vessel, Hampton Roads.

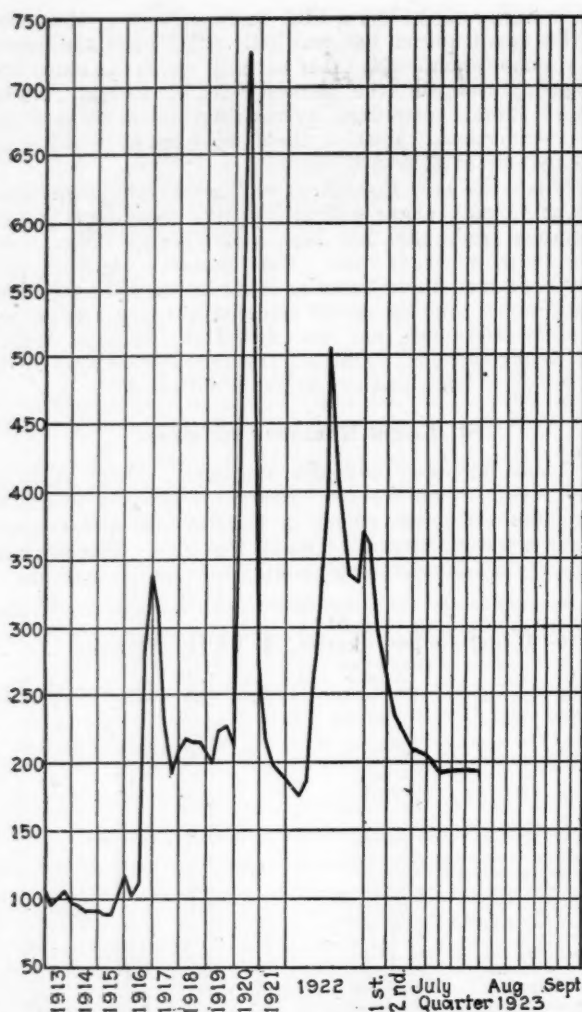
† Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Latest Pre-Strike		July 23, 1923		July 30, 1923†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34		\$7.60@	\$7.75	\$7.75@	\$8.35	\$7.75@
Broken.....	Philadelphia....	2.39	\$7.00@	\$7.50	7.00@	8.10	7.90@	8.10
Egg.....	New York....	2.34	7.60@	7.75	8.50@	12.00	8.00@	8.35
Egg.....	Philadelphia....	2.39	7.25@	7.75	9.25@	11.00	8.10@	8.35
Egg.....	Chicago....	5.06	7.50	8.25	8.50@	12.00	8.50@	12.00
Stove.....	New York....	2.34	7.90@	8.20	8.50@	12.00	8.00@	8.35
Stove.....	Philadelphia....	2.39	7.85@	8.10	9.25@	11.00	8.15@	8.35
Stove.....	Chicago....	5.06	7.75	8.25	8.50@	12.00	8.50@	12.00
Chestnut.....	New York....	2.34	7.90@	8.20	8.50@	12.00	8.00@	8.35
Chestnut.....	Philadelphia....	2.39	7.85@	8.10	9.25@	11.00	8.15@	8.35
Chestnut.....	Chicago....	5.06	7.75	8.25	8.50@	12.00	8.50@	12.00
Ranges.....	New York....	2.34			8.30		8.30	
Pea.....	New York....	2.22	5.00@	5.75	6.75@	8.00	6.75@	8.00
Pea.....	Philadelphia....	2.14	5.50@	6.00	7.00@	7.50	7.00@	7.50
Pea.....	Chicago....	4.79	6.00	6.25	7.00@	8.50	5.30@	5.65
Buckwheat No. 1.....	New York....	2.22	2.75@	3.00	2.75@	3.50	2.75@	3.50
Buckwheat No. 1.....	Philadelphia....	2.14	2.75@	3.25	2.75@	3.50	2.75@	3.50
Rice.....	New York....	2.22	2.00@	2.50	1.80@	2.50	2.00@	2.50
Rice.....	Philadelphia....	2.14	2.00@	2.50	1.75@	2.50	1.75@	2.50
Barley.....	New York....	2.22	1.50@	1.85	1.25@	1.50	1.25@	1.50
Barley.....	Philadelphia....	2.14	1.50@	1.75	1.25@	1.50	1.25@	1.50
Birdseye.....	New York....	2.22		2.00@	2.50	1.60	1.40@	1.60

* Net tons, f.o.b. mines.

† Advances over previous week shown in heavy type, declines in italics.



Index	1923				1922
	July 30	July 23	July 16	July 16	July 31
Index	196	197	198	556	
Weighted average price	\$2.37	\$2.38	\$2.40	\$6.73	

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

Kentucky Steam Prices Weaken

Western Kentucky operators while making a hard fight, have been unable to hold prices on steam coal, due to the competition from other fields. Cheap stripper mine-run has been offered at prices as low as \$1.35 a ton. Prepared coals are selling at \$2@2.75 according to size and quality, except some little nut offered as low as \$1.90 a ton. There has been a very fair demand for egg.

Movement is scattered. There is some domestic business moving South and also North and Northwest, including the Chicago as well as Michigan districts. Moving screenings hasn't been easy, but they have been going to numerous industrial points.

There is some strike talk in southeastern Kentucky where there are a few organized mines. There also is talk of reduction in wage scales in those sections, so that the operators can again enter the market in competition with organized fields, but under a lower production cost.

Northwest Takes Notice

A spotted awakening of domestic business is now to be noted throughout the Northwest. All summer railroads have set a good example by moving a good deal of their coal off the docks to line storage, thus clearing the way for future heavy dock business, and country dealers have fol-

lowed the same plan by taking all the anthracite they could put in. The result is that a slight pick-up in dealer business in anthracite, Pocahontas and high-grade soft coals in the regions around Milwaukee and Minneapolis finds the dealers ready. Around Duluth experts believe business in soft coal would be starting briskly were it not for recent price cuts, especially in Kentucky coals. These have left buyers dubious. They don't want to buy and get pinched by a further drop.

Prices at the Head-of-the-Lakes show another softening of about 25c. on screenings and a general loosening all along the line. Youghioghenny and Hocking screenings are still quoted at \$4, but recently 12,000 tons moved at \$3.85. Lump is \$6.50 and pile run \$5@5.25. Other quotations are: Splint, lump, \$7.25; dock run, \$6.25; screenings, \$4.50. Pocahontas, \$10, \$7.50 and \$6.25. Smithing, \$8. Millers Creek Kentucky lump, \$9.50; screenings, \$5.75. Elkhorn, \$8.50, \$7.50 and \$5. Hard-coal prices are firm thus: Egg, \$12.50; stove, \$12.80; nut, \$12.85; pea, \$11; buckwheat, \$8.50.

West Also Sees Winter Coming

In the mountain regions of the West a slight market pick-up is noticeable. The Aug. 1 advance of 25c. in some Colorado coals and the fact that Colorado farmers and fruit raisers are getting returns from their crops has started some coal buying. Colorado prices are: Canon City and Walsenburg lump, \$5.75; nut, \$5.25; slack, \$2.50. Trinidad lump, \$4.75; nut, \$4.50; slack, \$3.50. Semi-anthracite egg, \$7.50; nut, \$7.25; chestnut, \$2.75.

In Utah there is a slight improvement of market, but conditions are still typical of summer. The Utah Copper Co. bought 200,000 tons with slack at \$1.25 and lump at \$3.75 and \$4. Other industrials also have been buying some. Domestic demand remains almost lifeless. Production, however, is fairly high. June showed an increase over May. The total for the first six months of the year was 2,114,128 tons as compared with 2,100,251 in 1922. Prices are unchanged.

Nothing is doing in the Kansas City region except an advertising campaign by dealers and producers. It is not stimulating domestic buying much. Of those mines that are working few are getting more than two days running time each week.

Mixed Market Situation in Ohio

Further weakness is manifest in the smokeless market around Cincinnati. While there is no move toward price cutting on the surface it is said that there has been some cuts in run-of-mine. Rejections of coal has tended to influence lower prices. West Virginia 2-in. lump was quoted \$2.50@2.75 as compared with \$2.25@2.50 last week and Southeastern Kentucky 2-in. lump \$2.40@2.75, as compared with \$2.25@2.50. Retail prices for August have been announced as follows: Pocahontas lump, \$10@11, run of mine, \$7.50@8, bituminous lump, \$7.50@8.25 and slack, \$4.50@4.75. A slight improvement for domestic sizes at Columbus and central Ohio developed more activity. Steam coals continue slow, however. There was a better demand for Pocahontas and smokeless grades as well as for Ohio-mined domestic coals. A large majority of steam coal users are waiting for bargains on distress coals, but this is not so much in evidence because of mines closing. Utility buying is more brisk while the railroads are taking their usual tonnage.

Reserve stocks are estimated at from forty-five to sixty days in most industries. The Southern Ohio Coal Exchange reports that for the week ended July 4 there were 133,532 tons of coal mined by the 442 mines reporting, with a full time capacity of 721,746 tons. No improvement is noticed in the demand for steam coals at Cleveland, but there is some new activity in the domestic trade, due probably to the fear of labor trouble in the anthracite fields. Inquiries are a trifle more brisk, causing operators and jobbers to believe there is an improved tone in the market.

The market for slack at Pittsburgh has stiffened slightly, due to more mines closing, mines that had to sell most of their product and were obtaining the poorest prices. The steel mills are buying only from hand to mouth. A moderate volume of gas mine-run is moving, but the tonnage is

generally smaller than that of screened. Business is quiet at Buffalo. Youghiogheny gas lump is being quoted at \$2.75@3 f.o.b. mine. Central Pennsylvania operators at Altoona believe the bottom has been reached in prices and that the demand is on the increase. During the week ended July 22 loadings were 17,350 cars, as compared with 18,514 cars the previous week.

Decline in the preparation of egg and lump has resulted in a slight stiffening for slack in northern West Virginia. There was more inquiry from large consumers but the additional orders received so far have failed to change conditions.

Dullness Continues in New England

The market in New England shows little improvement. Consumption is much less than was expected, and more than a few large consumers are trying to hold off shipments on contract. There also are rumors of coal rejected because of poor preparation or because of some defect not looked for at the time of purchase, and this is recognized by the trade as an unfailing indication of a dull market.

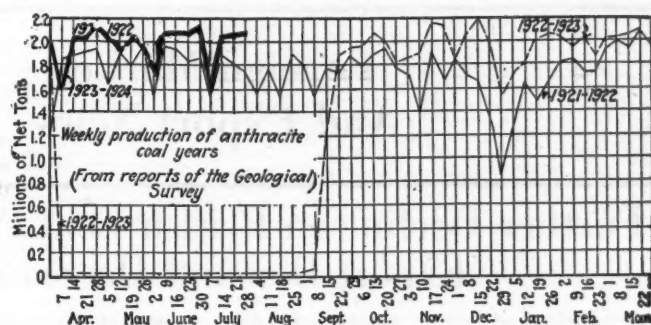
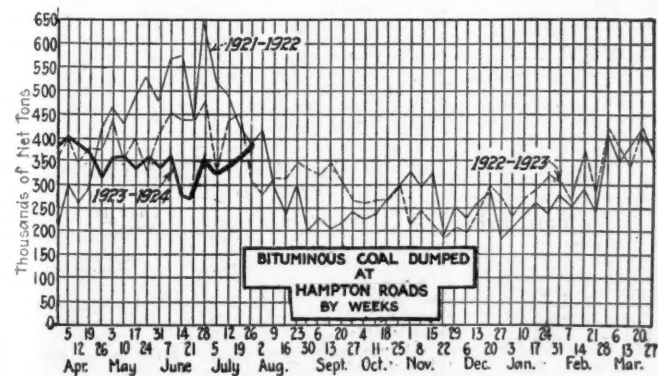
Pocohontas and New River share the dullness. While producers are pursuing an extremely close-hauled policy as to current mining there are enough agencies strenuously soliciting business to make prices rather softer than a fortnight ago. On No. 1 Navy standard grades the range is \$5.35@5.60, with an occasional sale rumored at \$5.25, in each case per gross ton f.o.b. vessel. At this end, for distribution, prices on cars vary from \$6.75 to \$7.25, depending upon the factor and his view of the market. Inquiry is very light, however, and buying power has practically disappeared.

From central Pennsylvania the volume all-rail is much diminished. Except on firm contracts receipts here show a marked falling-off as compared with a month ago and while the territory is being actively canvassed at minimum prices there is little sale for current output. Shipments via the New York and Philadelphia piers also have shrunk materially and there are few today who dare predict any increase in demand during August.

A few operators in central Pennsylvania have orders enough to justify operation on practically full time for August and September. But the bulk of these orders are contracts with staple industries that have not been obliged to relax. The textile mills in New England are suffering seriously from high wage cost and competition from English manufacturers.

Demand Weak in Atlantic Seaboard Markets

Demand for soft coal along the Atlantic seaboard remains dull although some producers believe they discern a slight improvement in inquiries and actual business. Consumers are being advised to purchase coal in anticipation of autumn and winter requirements. Shippers at New York were interested in the bids opened by the War Department at Brooklyn last week for furnishing coal to army posts and arsenals in New England, the prices on which ranged from \$1.97@3.75 f.o.b. mine, according to grade and quality of coal. Dumpings at the New York terminals average around 500 cars daily. Producers and shippers of bituminous domestic coals report a fair number of orders received. At Philadelphia consumers are debating long before adding to their reserve stocks, although being urged to fill their



bins. One reason given for the failure of various industries to accumulate stocks is the uncertain business conditions, particularly in the cotton and woolen goods lines. There is keen competition on some of the better grades at Baltimore. Some of the larger consumers are moving to get supplies against autumn needs, but this movement is not yet sufficient to bolster prices. The market at Birmingham is weak and sluggish with the domestic trade easy on new business. Contract coal is moving to the railroads in a satisfactory manner. Men continue to leave the district, while the mines and industrial plants are recruiting labor from the farms and lumber camps to keep their organization intact.

Last week there were received at Duluth sixty-one cargoes of coal, of which ten were anthracite. There is a fair tonnage moving to the lakes from the Ohio mines, but the movement has slowed down somewhat due to congestion at the lower ports. Loadings of anthracite for the week at Buffalo were 91,900 net tons.

Domestic Anthracite Market Stiffens

Discontinuance of the wage conference at Atlantic City resulted in a stiffening of the market for domestic coals. Shippers of independent coals were rushed with inquiries, but as many operators were already booked with sufficient orders to carry them well into August, not many new orders were accepted. Quotations became stronger. Stove coal is the shortest of the larger sizes and when shipped straight is being quoted at about 25c. more than either egg or chestnut. Some shippers are pushing pea coal in conjunction with the larger sizes, while some retail dealers are taking either bituminous or the buckwheat coals, when given egg, stove or chestnut coals. Baltimore retail dealers are rushed with orders, while few of them have any supplies of importance in their yards. Many are out of stove coal entirely. Receipts of hard coal at Baltimore for the three months ending July 1 totaled 4,098 cars, or approximately 184,000 tons. Retail dealers at Toronto say they have never had such a heavy demand for anthracite during the summer as they are now having.

"Production of anthracite in the week ended July 21 decreased 2 per cent as compared with the week preceding," says the Geological Survey. "On the basis of 38,335 cars loaded, reported by the nine principal anthracite carriers, the total output, including mine fuel, local sales and the product of washeries and dredges, is estimated at 2,005,000 net tons. Early returns on car loadings during the week July 23-28 indicate a slightly higher rate of production and a probable total output of 2,075,000 net tons."

THE RHODES FUEL CORPORATION, of New York City, was awarded a contract by the U. S. Shipping Board at New York for furnishing and delivering alongside vessels New York harbor by Aug. 7 1,600 gross tons Pool 9 coal at a price of \$5.54, or on a basis of about \$2.27 per net ton f.o.b. mine. Other prices submitted ranged from \$5.54 to \$6.25 per gross ton alongside. The bids were opened July 28.

Car Loadings, Surpluses and Shortages

	Cars Loaded		
	All Cars	Coal Cars	
Week ended July 14, 1923.....	1,019,667	193,831	
Previous week.....	854,748	160,218	
Same week in 1922.....	850,667	77,097	
	Surplus Cars		
	All Cars	Coal Cars	Car Shortage
July 14, 1923.....	84,210	4,865	5,574
Same date in 1922.....	233,029	151,727	2,700
July 7, 1923.....	64,067	4,620	6,888
			3,867

Foreign Market And Export News

Further Decline in British Coal Production; Export Demand Decreases

Production of coal in Great Britain's mines continues to decline gradually, the output for the week ended July 14 amounting to 5,042,000 tons, says a cable to *Coal Age*. This is 264,000 tons below that of the previous week. A cable dispatch from American Commercial Attaché Tower at London to Washington as of July 20 stated that production was still decreasing slightly and that export demand was light, especially to Germany and France. Congestion due to the dock strikes continued, while price concessions were made when vessels were available.

The Welsh coal trade is quiet, due largely to the strike of dock workers. Operators, however, are confident that business throughout the rest of the year will be satisfactory, and predict that conditions will be considerably firmer from August. The few days' holiday at the beginning of August will mean a shortage of coal during the remainder of the month. Foreign buyers realize that they cannot take risks by postponing orders, and a fair amount of business is being done in spite of the present difficulties. Several contracts have been arranged and a number of inquiries are still open.

During the week ended July 6 exports of coal from the Bristol Channel showed a decline of 105,000 tons and were the lowest weekly shipments this year, excluding holiday weeks. Increased exports were made to Germany, but a severe decline to Italy.

Hampton Roads Market Stronger

The market at Hampton Roads last week was somewhat stronger, with heavier shipments moving and others in immediate prospect. Foreign movement was fairly heavy, high volatile coal being shipped for export in considerable quantities from the Newport News piers.

Coastwise trade showed more life, while bunkers continued heavy. The trade regarded the seasonal slump, which began about thirty days ago, as having been fairly well overcome. The outlook was brighter.

Export Clearances, Week Ended July 28, 1923.

FROM BALTIMORE	
For Belgium:	
Belg. SS. Gasconier, (coke)	1,935
For California:	
Am. SS. Eastern Knight	889
For Canada:	
Br. SS. Lord Strathcona	10,593
Br. SS. Knockflerna	7,986
Br. SS. Kamouraska	7,784
Br. SS. Wabana	7,478
For Holland:	
Ital. SS. Salina	8,411
For Italy:	
Ital. SS. M. T. Cicerone	10,636
Br. SS. Cornish City (coke)	4,979
Ital. SS. Gregorio	5,869
For Porto Rico:	
Am. SS. Delisle	1,009

FROM HAMPTON ROADS

For Brazil:	
Dan. SS. Dania, for Buenos Aires..	3,909
Br. SS. Sant Dunstan, for Rio de Janeiro	6,800
For Canada:	
Amer. Schr. Mary F. Barrett, for St. Johns	2,073
Br. SS. Susan Cameron, for Charlotte-town	1,031
Fr. SS. Capitaine Le Masne, for Montreal	6,251
Br. SS. Manchester Spinner, for Sydney, N. S.	7,667
For Cuba:	
Br. SS. Putney, for Havana	2,203
Br. SS. Ilford, for Havana	6,477
For France:	
Fr. SS. P. L. M. 10, for Rouen	4,274
For Holland:	
Ital. SS. Mazzini, for Rotterdam....	7,567
For Italy:	
Ital. SS. Gerty, for Trieste	2,078
Ital. SS. Lanuvium, for Savona	5,974

FROM PHILADELPHIA

For France and Belgium:	
Belg. SS. Gasconier, for Dunkirk and Antwerp	

United States June Coal and Coke Imports

(In Gross Tons)		1922	1923
Anthracite.....	64	5,716	
Bituminous { free.....	135,343	10,252	
{ dutiable.....		35,068	
Totals.....	135,343	45,320	
Imported from:			
United Kingdom.....	3,889	10,207	
Canada.....	120,111	35,113	
Japan.....	300		
Australia.....	8,187		
Other countries.....	2,856		
Coke.....	4,238	8,779	

United States June Exports By Customs Districts

	(In Gross Tons)		
	Anthracite	Bituminous	Coke
Maine and New Hampshire.....	10	4	196
Vermont.....	1,246	2,885	1,430
St. Lawrence.....	127,046	288,609	1,067
Rochester.....	76,765	72,882	22
Buffalo.....	193,558	262,973	28,199
New York.....	9,360	2,657	1,811
Philadelphia.....	5,334	58,841	1,640
Maryland.....		340,351	6,050
Virginia.....		192,438	
South Carolina.....		30,474	
Florida.....		6	252
Mobile.....		500	293
New Orleans.....		566	79
San Antonio.....	43	193	74
El Paso.....	65	3,301	1,057
Arizona.....		3,482	7,405
Los Angeles.....	2	3	7
San Francisco.....	24	1,000	
Washington.....		114	
Alaska.....		2	
Dakota.....	902	2,452	335
Duluth and Superior.....	257	754	
Michigan.....	18	126,090	13,677
Ohio.....	3,964	1,028,192	237
Iowa.....			10
Totals.....	418,594	2,418,769	63,841

United States June Coal and Coke Exports

	(In Gross Tons)	
	1922	1923
Anthracite.....	40,284	418,594
Bituminous.....	540,550	2,418,769
Exported to—		
France.....		135,849
Italy.....	14,359	110,175
Netherlands.....		14,766
Other Europe.....		130,293
Canada.....	427,849	1,822,996
Panama.....	19,101	
Mexico.....	5,937	11,560
Br. West Indies.....	2,349	17,815
Cuba.....	17,517	39,929
Other West Indies.....	6,593	21,987
Argentina.....	12,893	11,632
Brazil.....	11,050	47,326
Chile.....	4,697	7,468
Egypt.....	10,995	
French Africa.....		27,778
Other countries.....	7,210	9,195
Coke.....	29,090	63,841

Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.:		July 19	July 26
Cars on hand.....		1,370	1,246
Tons on hand.....		74,662	72,405
Tons dumped for week.....		133,344	124,907
Tonnage waiting.....		19,000	9,850
Virginian Ry. piers, Sewalls Pt.:			
Cars on hand.....		1,846	1,843
Tons on hand.....		106,400	108,870
Tons dumped for week.....		101,443	109,349
Tonnage waiting.....		3,568	30,653
C. & O. piers, Newport News:			
Cars on hand.....		1,160	1,334
Tons on hand.....		60,485	59,100
Tons dumped for week.....		84,837	115,967
Tonnage waiting.....		23,340	26,640

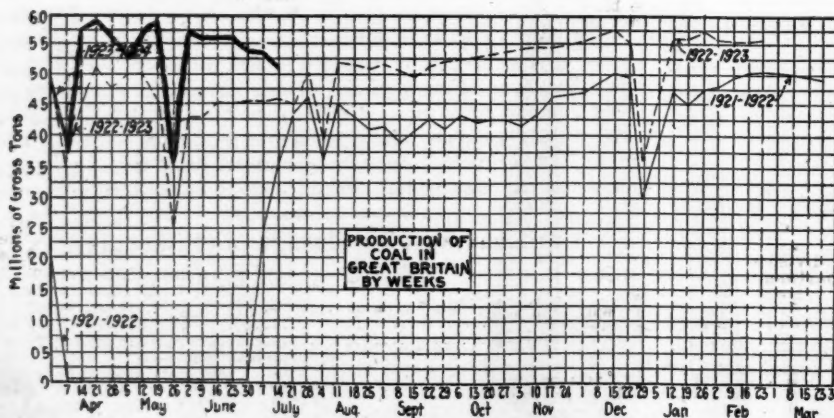
Pier and Bunker Prices, Gross Tons

PIERS		July 21	July 28†
Pool 9, New York.....	\$5.35@	\$5.85	\$5.25@ \$5.75
Pool 10, New York.....	5.00@	5.40	4.90@ 5.25
Pool 11, New York.....	4.50@	5.00	4.75@ 5.00
Pool 9, Philadelphia.....	5.25@	5.75	5.20@ 5.70
Pool 10, Philadelphia.....	4.45@	5.25	4.35@ 5.20
Pool 11, Philadelphia.....	3.70@	4.35	3.70@ 4.35
Pool 1, Hamp. Roads.....		5.50	5.40@ 5.60
Pools 5-6-7, Hamp.Rds.		4.50	4.25@ 4.50
Pool 2, Hamp. Roads.....		5.25	5.10@ 5.20
BUNKERS			
Pool 9, New York.....	5.65@	6.15	5.55@ 6.05
Pool 10, New York.....	5.30@	5.70	5.20@ 5.55
Pool 11, New York.....	4.80@	5.30	5.05@ 5.30
Pool 9, Philadelphia.....	5.70@	6.00	5.65@ 5.95
Pool 10, Philadelphia.....	4.80@	5.60	4.75@ 5.55
Pool 11, Philadelphia.....	3.90@	4.65	3.90@ 4.65
Pool 1, Hamp. Roads.....		5.50	5.40@ 5.50
Pool 2, Hamp. Roads.....		5.25	5.10@ 5.20

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to Coal Age		July 21	July 28†
Admiralty, large....		31s.	30s.@ 31s.
Steam smalls.....		21s.6d.	20s.@ 22s.
Newcastle:			
Best steams.....	26s.@	26s.6d.	26s.9d.@ 26s.6d.
Best gas.....		28s.	28s.
Best bunkers.....		28s.	26s.@ 27s.

† Advances over previous week shown in heavy type, declines in italics.



News Items From Field and Trade

ALABAMA

R. A. O'Rear and Ed O'Rear have leased their Pratt Warrior coal mine on the Warrior River for five years to the Gulf States Portland Cement Co., with headquarters at Demopolis, which agrees to mine and pay royalty on a minimum of 25,000 tons of coal annually. The O'Rears retain a right to keep a commissary and collect rent for houses at the camp.

ALASKA

E. L. Bedell, president of the Alaska Bituminous Coal Co., announces that 14,000 acres of coal-bearing land situated on Moose Creek are to be exploited by a group of business men of Anchorage; that outside shipments of coal are being deferred until next April because of the necessity of supplying substantial quantities to the Alaskan R.R. in the next three months; that a spur from the Matanuska branch of the railroad to the coal properties will be completed by September, and that, as the coal is of high quality, averaging better than 12,000 B.t.u., with about 12 per cent ash, it is confidently expected that a large market can be built up with Portland and San Francisco on the Pacific coast. The company plans to purchase two ships of not less than 500 tons, one of which will be used for supplying coal to Alaskan coast centers and the other to carry coal to Oregon and California. Twenty thousand tons is said to be blocked out and no difficulty is likely to be experienced in reaching a daily production of 1,000 tons.

COLORADO

R. H. Keays, chief engineer of the Moffat tunnel, which will be under construction within 30 days, has just returned to Denver following an inspection trip. Major L. D. Blauvelt, chief engineer of the State Highway Department, who made the preliminary work on surveying with other engineers, was congratulated on his choice of a site for the tunnel. Mr. Keays, a New York city engineer, was recently appointed by the tunnel commission of five members. The Moffat tunnel will open up a coal field in northwestern Colorado heretofore handicapped by lack of direct transportation facilities.

ILLINOIS

Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co., at West Franklin, is about to install the largest coal-mining hoist in the world. The new hoist will be more than twice as large as any coal-mine hoist in America at the present time, having two motors, one mounted at each end of the drum shaft, each with a capacity of 2,200 hp. at 40 deg. C. rise. Coal will be hoisted in skips, each having a normal capacity of 22,000 lb. and a maximum capacity of 26,000 lb. The depth of the shaft is 607 ft. and the coal will be dumped from the mine cars at the bottom of the shaft by means of rotary dumps. Under normal conditions the output per hour will be 1,500 tons, but it will be possible to increase it to 2,000 tons per hour.

The Brenner-Moxley-Mervis Co., capitalized at \$600,000, has acquired an 8-acre tract in Chicago, where it will manufacture copper rods and drawn copper wire for power transmission. The officers of the new company are: Nathan T. Brenner, president; William J. Moxley and George T. Moxley, vice-presidents; N. T. Brenner, Jr., treasurer, and Meyer B. Mervis, secretary.

R. E. Fagerburg, who was graduated from the department of mining engineering, University of Illinois, in June, is coal mine inspector for the Chicago, Wilmington & Franklin Coal Co., of Chicago. R. E. Lacy, who also was graduated this spring, is assistant superintendent of the Brewerton Coal Co. at Springfield. O. G. Stewart, who obtained his master's degree in coal mining at Illinois this spring, is with the Nokomis Coal Co. as Engineer at the No. 1 mine at Nokomis.

The following itinerary for the Illinois Miners' Examining Board for the month of August is announced: Collinsville, Aug.

6; Eldorado, Aug. 7; Herrin, Aug. 8; West Frankfort, Aug. 9; Du Quoin, Aug. 10; Centralia, Aug. 11; Litchfield, Aug. 13; Springfield, Aug. 14; Taylorville, Aug. 15; Danville, Aug. 16; La Salle, Aug. 17 and Peoria, Aug. 18.

The Valler Coal Co., operating one of the largest and most up to date collieries in Southern Illinois, has closed down for repairs.

INDIANA

Fourteen persons were injured, some of them probably fatally, when a mine cage upon which they were being lowered into the shaft of the Vermillion mine, fell to the bottom, a distance of 125 ft. All of the men sustained broken legs and arms and some are injured internally. J. E. Padgett, engineer, collapsed after the accident and is in a serious condition.

The Modern Fourth Vein Coal Co., of Jasonville, has been incorporated for \$350,000 by John Williams, T. G. Williams, C. W. Wenner, W. C. Clifford, F. W. Adams, O. H. Finnical and F. B. Grove.

KANSAS

Two hundred miners of the Home Riverside Coal Mining Co. at Leavenworth, went on a strike recently, refusing to load coal from a mine where another miner was ordered to quit work by the district officials because of the conditions existing there.

One-day coal service from the southeastern Kansas coal fields to Kansas City was started July 25 by the Frisco railroad, with its "Kansas City Carbon Special," a fast freight operating between the coal field and Kansas City every night except Sunday. The railroad company promises to move every car of coal routed from the southeastern Kansas field to Kansas City over its lines the night it is billed. The Missouri Pacific has maintained similar service some time. In the case of both roads the specials mean a time saving of from two to as many as eight days in deliveries to the Kansas City market.

KENTUCKY

The Bradbury-Seullin Coal Co. has put down a slope near the ill-fated Lester strip. It has a 200-acre lease and hopes to get out 200 tons daily. The company recently bought the new Prosperity mine at Carterville and also the Doran mine near Hurst. These are all 100 to 300 tons per day mines.

MASSACHUSETTS

Bids opened July 25 by the Quartermaster's Department of the U. S. Army at Brooklyn for furnishing and delivering hard and soft coal to the forts, camps, arsenals and other army buildings in the New England States and part of New York State showed a wide range. Bidders were required to submit an analysis of the coal on which they were bidding, and these with a few exceptions were confined to pool 10 quality. The prices submitted for furnishing 730 net tons of run-of-mine coal to Camp Devens, Mass., ranged from \$1.97 to \$3.75 f.o.b. mines, while bids for furnishing and delivering 1,000 net tons of run-of-mine coal to the Springfield (Mass.) Army ranged from \$1.98 to \$3.25. Prices on 450 net tons of 2-in. lump coal for Camp Devens ranged from \$2.38 to \$4.25. The same range of prices prevailed in the bids received for furnishing run-of-mine coal to the other points. For furnishing and delivering egg, stove and chestnut coal the prices submitted ranged from \$11.16 to \$12.75 per net ton f.o.b. mine, or on a basis of \$12.50 to \$14.25 per gross ton f.o.b. mine.

Agents of Hermann C. Lythgoe, chief of the division of food and drugs of the State Department of Public Health, acting under the pure coal law passed by the General Court early in the year, will dump into the harbor 700 tons of "fireproof" coal which was to have been sold to the householders of Roxbury. A month or two ago the supply of a Roxbury dealer was seized by the state when it was found to be unburnable.

The dealer asked for permission to sort the lot over and reclaim such as was found to be burnable. This request was granted and the 700 tons to be dumped represents the residue. Since the law went into effect the department has condemned also two cars of coal in Holyoke, one in Quincy and one in Haverhill. Seven cars of coal in the yards of a Boston dealer have been examined and pronounced to be not of first class quality, but of a grade which would not warrant the state to condemn it. The dealer has been directed to mix four cars of first-class coal with the seven cars before he sells it.

MINNESOTA

The City of Two Harbors is about the point on Lake Superior in which the operation of a municipal dock will be continued during the coming winter. All other points have dropped out, finding the venture unprofitable and of doubtful benefit to consumers. The City Council of that place has awarded a contract for 5,000 tons of steam coal to the Valley Camp Coal Co. at \$6.54 per ton. It is proposed to sell to consumers at \$10 per ton.

MISSOURI

In the Fulton district the 1922 scale of 10c. a bushel for digging coal in ordinary rooms and 11c. a bushel for "tight rooms" or "turn corners" will prevail for the coming year, beginning Aug. 1. Tom Kite, president of the union, also announced that if the factories and state institutions of the city award contracts to Illinois companies for coal deliveries during the next month and a strike in the Illinois coal field results in shutting off the supply here, the miners will demand a bonus for filling the contracts with Fulton coal. In the last strike the Fulton miners made good money by filling orders in neighboring towns when the mines in the other parts of the country shut down. The Fulton miners declare that there is a prospect of Illinois companies getting contracts around Fulton because they can furnish it cheaper than Fulton companies. A new railroad bridge near that city will soon enable the Chicago & Alton to haul direct to Fulton, whereas heretofore cars had to be reloaded at Mexico, and this expense added to the Illinois price made coal too costly. The Fulton miners have a local union but are not affiliated with the United Mine Workers of America and make their agreements independent of the national body.

NEW YORK

The Virginia Iron, Coal & Coke Co. for the quarter ended June 30, reports net income of \$114,984, after interest and taxes. After preferred dividends, this equals 52c. a share on the \$10,000,000 common stock, which compares with \$243,559, or \$1.81 a share, in the first quarter, and \$95,959, or 33c. a share in the corresponding quarter of last year. The gross operating revenue for the quarter ended June 30 was \$2,241,133, as against \$210,782 for the quarter ended June 30, 1922. The net earnings for the six months ended June 30 were \$358,543, against \$14,912 in the corresponding six months a year ago.

OHIO

The Cincinnati Retail Coal Dealers' Association held its annual outing recently at Tower Hill, on the Little Miami River. David Minten and Tom Bolder were in charge of the affair.

PENNSYLVANIA

An explosion wrecked the bridge of the Baltimore & Ohio R.R., a half mile from Holsopple, Somerset County, Tuesday night, July 17, leaving the ends hanging from either side of the river bank. The bridge is used largely by the Hillman Coal Co., for transporting coal cars from Holsopple to Jerome, a distance of five miles. The explosion occurred at the center of the 200-ft. bridge. The only explanation given was that labor trouble that the Hillman Coal Co. had near Jerome might be responsible. Nine men were arrested at Boswell, charged with destroying the bridge, and eight were given a hearing before Justice of the Peace C. S. Ickes on July 24, held for court trial and placed under \$2,000 bail each. The eight charged with dynamiting the bridge are: Arthur Ramsell, secretary of the Jerome local, United Mine Workers; William Gregory, Michael Reskoffsky, Michael Keishack, John Labotka, Munzio Pacifico, Clement Accitello and John Goodiska. John Braenzanski, a barber of Jerome, was held as a material witness.

Pacifico, it is alleged, offered damaging evidence against the other seven men when accorded a separate hearing on July 23. Replacement of the bridge will cost \$160,000.

Frank Gibbons, aged 31, who was caught under a fall of rock at the Raub Coal Co.'s mine in Luzerne July 23 and entombed for almost nine hours before being rescued, died from his injuries that evening in the Nesbitt West Side Hospital.

A coal test house situated in No. 5 colliery yard of the Hudson Coal Co. at East End, Wilkes-Barre, was destroyed by fire on July 21. Several cars of coal standing on nearby tracks were destroyed.

Ground was broken July 24 at Scranton for the monument to John Mitchell to be erected by the members of the United Mine Workers, Neil J. Ferry, of McAdoo, an international organizer of the miners, turned the first shovelful of dirt. The monument will be on the east side of Court House Square fronting Adams Avenue and will cost \$65,000.

Robert Johnson, of Pittston, who has been State mine inspector of the eighth inspection district during the last seven years, has tendered his resignation to the State Department of Mines. Under the last appointment Johnson had one more year to serve.

Evan B. Williams, superintendent of the Hudson Coal Co. at Gravity Slope, Archbald, has been transferred to the Pine Ridge colliery, at Miners Mills with charge over Lafin colliery also. Nathaniel Dixon, superintendent at the Clinton colliery in Vandling, will succeed him.

The annual first-aid competitions conducted by the Susquehanna Collieries Co. in the five divisional headquarters will be held as follows: At William Penn, near Shenandoah, Aug. 31, at 6:30 p.m.; at Lytle, near Minersville, Sept. 6, at 7 p.m.; at Lykens, Sept. 7, at 7:30 p.m.; at Nanticoke, Sept. 11, at 7:30 p.m.; at Shamokin, Maysville Park, Sept. 18, at 7 p.m. These will be open-air events with the exception of the meet at Nanticoke, where the first-aid tests will be conducted in the state armory.

The York Farm Washery Co., near Pittsville, so reduced the great pile of culm from which it has been reclaiming coal of domestic and steam sizes, that it will be cleaned up in about six months. The culm bank was started more than a quarter of a century ago when the Lehigh Coal Co. opened the big colliery at York Farm. The company abandoned mining there, because of the gaseous condition of the operation and the great expense of removing the coal.

Eddy Creek breaker of the Hudson Coal Co., at Olyphant, one of the oldest breakers of that company, has ceased to prepare coal for the market and from now on all coal handled from the different openings at this colliery will be shipped to the new Marvine and Olyphant No. 2 breakers. Nearly 100 men and boys will be thrown out of employment, it is estimated. It is reported that these two breakers will handle only the coal from the Eddy Creek colliery openings until a big modern breaker is constructed which will take care of all coal mined by the Hudson company in Olyphant, Dickson, Blakely and Throop.

The Lamoka Coal Co., headed by Walter J. Bennett, of Towanda, and capitalized at \$100,000, has taken over the coal lands recently owned by William Matchett, J. J. Morley, and E. J. Howe, and known as the Cash Coal Lands, in Bradford County. It is understood arrangements have been made for the installation of equipment that will provide for the removal of coal on a much larger scale than has ever before been attempted in this locality.

Six men were badly burned by an explosion of gas in the Avondale colliery of the Glen Alden Co., July 20. The victims were rescued after a battle with the flames that followed the explosion. Alex. Minnick, one of the men injured, died later at the Nanticoke hospital. Two others may not recover. Mine officials state that the explosion was caused by a ventilating door being left open. This allowed a body of gas to sweep into the gangway where the men were working and it was ignited by one of the men lighting a match.

Two electric pumps are to be installed by the Hudson Coal Co. at the No. 3 pump station, Carbondale, which will lift 10,000 gallons of water a minute. Workmen are now engaged in removing the old pumps, which were operated by steam, and it is asserted that hereafter the work will be done during one eight-hour shift instead of two twelve-hour shifts, as at present.

The Pennsylvania Topographic and Geological Survey has completed close field

and office studies of mines, mining conditions and coal waste in every bituminous coal-producing district in the state, begun last December for the U. S. Coal Commission. An estimate of coal reserves in each county which produces bituminous coal also has been completed and is included in the report to the federal commission. It is said the report will be made a part of the report which the Giant Power Commission's survey will make. This commission will soon be named by Governor Pinchot, who has plans for the utilization of the state's power from both coal and water. His plan contemplates the use of fuel near its source for the generation of electric energy and includes anthracite as well as bituminous coal.

Umpire Charles P. Neill rendered six decisions on July 22, five of which were decided in favor of the miners. The case that went against the men was that of certain contract miners at No. 4 shaft colliery against the Lehigh Coal & Navigation Co. in the Panther Creek section. When the 1922 suspension was directed the men left their tools in a storage place in the mines. During the suspension there was a fire in that section of the mines and the tools were either destroyed or taken. Umpire Neill denied the request for an order that the men be paid for their lost tools. Another case was that of contract miners at Audenried colliery No. 4 of Lehigh & Wilkes-Barre Coal Co. In this the terms of a 1917 agreement were in dispute, owing to a penalty of suspension imposed on the miners for refusal in coal he had mined. The decision directs that he be paid for the period of suspension. The decision, however, does not decide contention of either side as to the terms of the 1917 agreement. Furnishing of coal to a family at Audenried by the Lehigh and Wilkes-Barre Coal Company is directed at the usual rates allowed employees. The other three cases involve rates paid the men and in each the workman is directed paid at the rate he sought. The cases are against the Lehigh Coal & Navigation Co.

The Hudson Coal Co. recently entertained the employees of three of its mines at luncheon and an entertainment at which the addresses were illustrated by lantern slides of conditions existing in the mines. On the evening of July 24 upward of 1,000 employees of the Olyphant and Eddy Creek collieries at Olyphant were given a box luncheon by the company at which Sterling E. Van Horn, superintendent, presided. Two days later over 500 miners of the Coalbrook mine were entertained similarly at Carbondale at which William Davison, colliery superintendent, made an address on "Practical Mining Questions." Other speakers were Kenneth Lambert, colliery engineer, and Charles W. Wagner, superintendent of explosives. The employees of the Pine Ridge, Delaware and Laurel collieries at Scranton were entertained on the colliery grounds on July 23. Superintendent J. B. T. Jones, who was the principal speaker, explained new mining methods calculated to make the jobs held by the miners safer and better, declaring the company's aim is greater safety, greater production and a better grade of coal. It is understood that it is the purpose of the company to explain to the miners, by use of slides, both new and better means of drilling for coal, and methods by which black powder might be as effectively used as more expensive dynamite.

SOUTH DAKOTA

The Independent Coal Co., of Huron, has been incorporated for \$300,000 by W. A. Johns, Fred Stoll and William Wilkinson.

WEST VIRGINIA

The Black Hawk Colliery Co., of Detroit, is building a new tippie equipped with Marcus screens at its property at Big Creek.

The Coe Pocahontas Coal Co., of McComas, has contracted with the Roberts & Schaefer Co. for a steel tippie complete with loading booms, to be installed at its mine at Monclo.

E. E. White, president of the E. E. White Coal Co., and of the Winding Gulf Operators Association, plans to sail for Europe during the early part of August. Mr. White will remain abroad until about Oct. 1.

The Dell Coal Co. is the name of a new concern just launched by Charleston people, having a capital stock of \$50,000 and with headquarters at Charleston. Among those having an active part in forming this concern were E. D. Haywood, F. L. Thomas, H. H. Corrie, H. W. Ball, all of Charleston, and J. M. Hopkins, of Danville.

First-aid and mine-rescue contests will be held at Huntington, Aug. 11, according to

an announcement by the Department of Mines of West Virginia. It is expected that teams from all parts of the state will participate, and from the winners representatives will be selected for the national mine-rescue and first-aid contest.

Men prominent in business circles in southern West Virginia have organized the Lopinsky corporation of Welch, with a capital stock of \$300,000, expecting to operate on a large scale in the Pocahontas region. Behind the new company are Eugene Lopinsky, Mary Lopinsky, Morris H. Lopinsky, N. J. Rhodes and Graham Sale, of Welch.

W. L. Lee and associates of Glen Jean have organized the Dun Glen Fuel Co., with a view to operating in the vicinity of the Glen Jean. The new corporation is capitalized at \$50,000. Several large companies, including the McKell Coal & Coke Co., are operating in the same territory. Having an active part in organizing this company were Charles Ash, Belle Ash and C. D. Calloway, of Glen Jean and W. L. Lee and Goldia Fultz of Fayetteville.

The Sander Coal Co. has been organized with a view to operating in the Harrison County field, being capitalized at \$50,000. The general office of the company is to be at Clarksburg. Leading figures in organizing this concern were J. A. Sander, of Grafton; J. E. Kennedy and Marie Simpson, of Fairmont; J. A. Hornyak and John Vargo of Farmington.

Officials of the United States Coal & Coke Co. and of the Crystal Block Coal & Coke Co. recently gave a dinner at the club house at Gary in honor of Colonel Edward O'Toole, head of the United States Coal & Coke Company operations in McDowell, and Mrs. O'Toole, who returned a few weeks ago from an extended trip through South America, visiting their son, William O'Toole, U. S. Minister at Paraguay. Others present were W. J. Jenks, general manager of the Norfolk & Western Ry., of Norfolk, Va.; former Congressman and Mrs. Wells Goodykoontz, of Williamson; Mr. and Mrs. I. J. Rhodes, Mr. and Mrs. L. A. Osborn, Mr. and Mrs. J. N. Harman, Dr. and Mrs. Rutherford, Mrs. L. C. Anderson, Rummell Anderson, Mr. and Mrs. W. J. Hatfield and Mr. and Mrs. McGinnis Hatfield, all of Welch.

The following West Virginia coal companies have discontinued their corporate existence: Springdale Coal Co., of Morgantown; Superior Eagle Coal Co., of Huntington; Middle Fork Mining Co., of Huntington; Madne Coal Co., of Huntington; Barnsdall Coal Co., of New York; Madison Coal Co., of Huntington; Prockter Eagle Coal Co., of Huntington; Hart's Run Coal & Coke Co., of Uniontown, Pa.; Omar Coal Co.; Carroll Coal Co., Prockter Coal Co., all of Huntington. The Eagle Island Coal Co., of Huntington has decreased its capital stock from \$600,000 to \$200,000. Authority has been granted to the S. J. Patterson Pocahontas Co., of Dayton, Ohio, to withdraw its business interests from the state.

Several West Virginia coal concerns have reduced their capital stock in the amounts specified below: Buffalo Coal & Export Corporation, from \$250,000 to \$50,000; American Land & Mining Company, from \$50,000 to \$5,000; Northern Fuel Co., from \$125,000 to \$100,000; Ranger Coal Co., from \$200,000 to \$50,000; Federal Coal & Coke Co., from \$750,000 to \$50,000; The Fitz Coal Co., from \$200,000 to \$50,000; Eagle Island Coal Co., from \$500,000 to \$200,000.

It is reported that the Coal River Collieries Co., which operates in Boone County, as well as in Kentucky, and controlled by members of the Brotherhood of Locomotive Engineers, has obtained an option on the coal holdings of W. E. Deegans in several counties in southern West Virginia.

The Gage Coal & Coke Co., with headquarters in Pittsburgh, contemplates extensive improvements to its property four miles south of Belington, in Barbour County. The company owns a large acreage on the west side of Tygart Valley River, where it has had a mine in operation for several years. At this point a large power plant is being installed, consisting of three 125-h. p. boilers and a 250-k. w. generator. An aerial tramway of modern type capable of delivering approximately 1,200 tons per day of eight hours, will be installed during this summer, to transport the coal from the tippie to the east side to be loaded on the Western Maryland Ry., after having been converted into coke. Approximately \$40,000 will be spent in making these improvements. This company also has a mine located on the Western Maryland Ry. where they manufacture coke from 60 beehive ovens, modernly equipped, from

which the coke is drawn with a Covington Coke Extractor.

The following West Virginia coal corporations have gone out of business, their charters having been surrendered: Lundale Coal Co., Amherst Fuel Co., Three Forks Coal Co., Elliott Splint Coal Co., National Gas Coal Co., Consumers Fuel Co.

Osman E. Swartz, of Fairmont, whose appointment as general counsel of the Consolidated Coal Co. was recently announced, was the guest of honor at a dinner given by the Consolidation Coal Co. and the Monongahela West Penn Public Service Co., attended by 73 guests from various sections of the country. Tusca Morris, of Fairmont, of the legal staff of the consolidation company, was toastmaster and among others who responded to toasts were George M. Alexander, president of the Monongahela West Penn Public Service Co., Fairmont; A. M. Lynn, president of the West Penn Co. of Pittsburgh; D. I. Cahill, general counsel of the West Penn Co., Pittsburgh; Hugh H. Snoderly, assistant general auditor of the Consolidation Coal Co., New York; George M. Hoffheimer, of Clarksburg; Judge James A. Meredith of the West Virginia Supreme Court, Charleston. The dinner was given at the Deer Park Hotel, at Deer Park, Md., and signaled the departure of Mr. Swartz for New York, where he will succeed the late Col. S. W. Walker as the head of the legal staff of the Consolidation Coal Co.

Signalizing another important change in the ownership of mining properties in southern West Virginia was the purchase about the end of June of the capital stock of the Red Jacket Consolidated Coal Co. by the W. M. Ritter Lumber Co. The plants of the company on Mate Creek are now producing at the rate of about 4,500 tons daily. In course of construction is plant No. 5 and with its completion in the near future, about 1,000 tons per day will be added to the capacity of the company. It is proposed to build a four-track domestic coal tippie on Mate Creek not far from the present Junior tippie in new territory in the Red Jacket seam where it will be possible to develop a production of 1,200 tons a day. A new plant is to be built in the vicinity of the old Logan tippie on Lower Red Jacket from which by-product coal taken from the Alma seam will be shipped, the company owning a large acreage at this point. A production of 1,000 tons is expected at this plant. At plant No. 2 the old Junior tippie will be rebuilt. Improvements under way and to be made will bring production on Mate Creek alone up to 8,000 tons a day.

WASHINGTON

W. J. Gallagher, of Seattle, has subleased the Superior coal property in Chelalis from A. F. Plant and will operate the mine in the future.

WISCONSIN

The city purchasing board of Milwaukee has decided to continue to favor Eastern coal in the specifications governing the competition for the city's annual fuel supply. Dealers in Western coal claimed that they were being discriminated against and asked a revision of the specifications. A special committee will make a thorough study of the matter before another year. The city now uses 65,000 tons of coal. This amount will be increased by 22,000 tons as soon as a new water pumping station is completed.

WASHINGTON, D. C.

Revenue received by the government from royalties on mineral leases upon public lands and from the sale of such lands has amounted during the past two years to \$24,843,809, according to the Department of the Interior. Of this revenue \$12,981,809 came from royalties on mineral leases. Sales of coal leases totaled \$13,105 and royalties on coal leases in Alaska amounted to \$5,309.

CANADA

Coal production in British Columbia during June totaled 186,160 tons, an increase of 23,848 tons over that of the previous month. The collieries of Vancouver Island produced 129,616 tons last month, which is 32,252 tons in excess of that for May. It is clear, therefore, that the coal business has been improving on the coast and falling off in the interior. The Nicola-Princeton field also shows a slight increase in production, one thousand odd tons, for which the Middlesboro and Coalmont collieries are largely responsible. In the Crow's Nest Pass field there was a drop of 9,507 tons in output for June as compared

with May. The Coal Creek Colliery fell off 8,694 tons, that at Corbin 954 tons, while the Michel Colliery increased its output 141 tons. The poorer showing in this section of British Columbia no doubt is accounted for by the barrier erected by the Fordney tariff, making export to the United States at a profit practically out of the question, and the lack of demand in the Middle West. Following are the production figures for June:

Vancouver Island District	
Canadian Collieries:	
	Tons
Comox Colliery	22,661
Extension	20,264
South Wellington	5,164
Western Fuel Corporation of Canada:	
No. 1 Mine	27,002
Reserve Mine	17,801
Wakesiah Mine	7,377
Granby M. S. & P. Co.	19,626
Nanoose Wellington Colliery	5,176
East Wellington Colliery	3,723
King & Foster	822
Total	129,616
Nicola-Princeton District	
Middlesboro Collieries	6,397
Coalmont Collieries	9,609
Princeton Collieries	809
Total	16,815
Crow's Nest Pass District	
Coal Creek Colliery	22,254
Michel Colliery	15,388
Corbin	2,087
Total	39,729
Total for province	186,160

On recommendation of Commissioner Chisholm the Toronto Board of Control has decided to use the screenings from last year's supply of Welsh coal for the manufacture of briquets.

A mine-rescue competition was held at Blairmore, Alberta, in July, under the joint auspices of the mines department of the Province of Alberta and the Rocky Mountain branch of the Canadian Mining Institute. In addition to the mine-rescue and first-aid contests for men, there were prizes for the best first-aid demonstrations by women individually and in teams and a shield for juvenile competitors. Each team was given a different problem of a practical nature, such as may easily occur in a coal mine, involving the use of a breathing apparatus and a knowledge of first aid, and the work of the various teams clearly demonstrated the value of constant training with the apparatus in conjunction with organized team work. The work of the competing teams was appraised as follows: First, Michel Team, B.C. and Hy Grade (tie); third, Fernie No. 2; fourth, Bellevue No. 3; fifth, Nordegg; sixth, Fernie No. 1 and Coal Creek (tie); eighth, A.B.C., Drumheller; ninth, Bellevue No. 1; tenth, Blairmore No. 1; eleventh, Blairmore No. 2; twelfth, Lethbridge. The judges were Messrs. Horne, McDonald, Howell and Cranston, inspectors of mines for Alberta, and H. E. Miard and James Dickson, mines department, British Columbia.

Western Canada can hardly sell coal in Ontario. Dr. Charles Cammell, deputy minister of mines for the Dominion and who acted as chairman of the committee that went thoroughly into the problem in recent months, recently said that there was nothing to add to the committee's report. Generally it had been found that the coal fields of eastern Canada could take care of the requirements of the maritime provinces, Quebec, and a small part of northern Ontario; that the prairies, from a point near the western limits of the Great Lakes, and British Columbia were independent, having supplies within their boundaries that were adequate, but that there was a gap between the east and the west, comprising the greater part of Ontario, that, under present conditions, must be dependent upon coal imported from the United States. The investigation had served a good purpose in making clear the situation as to the fuel resources and fuel requirements throughout the Dominion, and with a thorough grasp of the problem it should be easier to regulate distribution in the future in the best interests of all consumers should regulation be necessary.

John L. Lewis, president of the International body of the United Mine Workers of America, has instructed William A. Sherman, president of District 18 (Eastern B.C. and Alberta), that it would be well to withdraw the call issued for a general labor conference in western Canada to decide upon a policy for sympathetic action in support of the striking miners of Nova Scotia. Mr. Lewis stated that the miners of District 18 must carry out the rules and

policy of the U. M. W. of A. and fulfill their obligations to the operators under the agreement in force. At the time of writing Mr. Sherman had not withdrawn the call but had promised a statement at a later date.

Output of coal from Canadian mines during April amounted to 1,287,400 net tons, a decrease of 12 per cent from the total for March, but an increase of 38 per cent over the average for the corresponding month of the three preceding years, according to the Dominion Bureau of Statistics. Production for the month showed decreases of 83,000 tons in Alberta, 70,000 tons in British Columbia, 16,000 tons in Saskatchewan and 10,000 tons in New Brunswick. There was an increase of 2,000 tons reported in Nova Scotia. The cumulative output from all mines for the first four months of 1923 amounted to 6,153,600 tons, an increase of 25 per cent over the preceding three-year average for the same period. Imports from the United States and Great Britain amounted to 1,171,200 tons, as compared with 1,817,700 tons in March, a decrease of 36 per cent, but 40 per cent greater than the preceding three-year average for the month. For the first four months of 1923 total importations were 5,956,800 tons, an increase of 35 per cent over the three-year average for the period. Imports of anthracite for April were 415,400 tons, of which 361,100 tons of egg, grate, stove, etc., sizes came from the United States, and 16,400 tons of the same sizes from Great Britain. The balance consisted of buckwheat and rice sizes of which 31,300 tons came from the United States and 6,600 tons from Great Britain. Exports of Canadian coal during April were 128,600 tons, as compared with 234,500 tons in March. Comparison of the April exports with the preceding three-year average showed an increase of 58 per cent.

Imports of about 55,000 tons of Scotch and Welsh anthracite have been received so far this season at Montreal, and if the demand continues the amount probably will be trebled before the close of navigation. Local dealers state that after last year's experience consumers will take every precaution to obtain an adequate supply.

Association Activities

Charles L. Dering, president of American Wholesale Coal Association, has appointed the following committees: Trade relations, Seth W. Morton (chairman), Albany, N. Y.; Charles A. Owen, New York City, and Charles L. Couch, Buffalo, N. Y. Budget, Lyle H. Dayhoff (chairman), E. M. Platt and G. H. Merryweather, all of Chicago, Ill.

Colonel A. C. Earnshaw has been appointed commission of the Chicago Coal Merchants Association. Colonel Earnshaw assumed office Aug. 1, taking the vacancy caused by the resignation of Commissioner Kendall, who joined a coal company sales organization a month or so ago. Colonel Earnshaw comes from the United States Internal Revenue office at Chicago. He is a world war veteran and has been in Chicago two years, coming from New York, where he was with the government in the Post Office Department. It is his first venture in the coal business.

Obituary

Benjamin U. Taylor, leading coal dealer of Olean, N. Y., and one of the widest known business men of that district, died July 21, at the age of 69 years, leaving a wife and several children.

James R. Bresnan, a coal merchant and prominent citizen of Brackville, Ont., died July 25, at the age of 76 years. He was a member of the town council for four years and harbor master of the port of Brackville.

William Leventry, died at his home in Johnstown, Pa. July 23, aged 73 years. For the past eight years he was engaged in the coal business with his brother, Lewis Leventry, under the firm name of Highland Coal Co., of which he was president.

Lafayette Mack Hall, 72, formerly a mine official in the Seco, Ky., district, and well known in southeastern Virginia, where he was formerly manager of the Gladeville Coal Co., died at Wise, Va., July 20.

Recent Patents

Rotation Release for Rock Drills. 1,452,154. Charles C. Hansen, Easton, Pa., assignor to Ingersoll-Rand Co., New York, N. Y. April 17, 1923. Filed July 23, 1920; serial No. 398,372.

Mine-Roof Supporting Method and Apparatus. 1,450,329. Edmund C. Morgan, New York, N. Y. April 3, 1923. Original application filed Jan. 5, 1916; serial No. 70,341. Divided and this application filed Sept. 9, 1922; serial No. 587,188.

Mine Car. 1,450,637. Michael E. Lohr, Johnstown, Pa. April 3, 1923. Filed Feb. 16, 1922; serial No. 536,983.

Coal Jig. 1,451,287. George W. Willmot and Francis H. Blatch, Hazleton, Pa., assignors to Willmot Engineering Co., Hazleton, Pa. April 10, 1923. Filed Sept. 26, 1922; serial No. 590,593.

Mine-Car Truck. 1,451,690. James R. Fleming, Scranton, Pa. April 17, 1923. Filed Mar. 30, 1922; serial No. 548,014.

Ball Pulverizing Mill. 1,452,786. Frank A. Brewer and George W. Branstom, Vancouver, B. C., Canada. April 24, 1923. Filed Aug. 11, 1921; serial No. 491,414.

Locking Device for Mine Cars. 1,452,923. John P. Miller, Duryea, Pa., assignor of one-half to Herbert S. Woodward, Carbon-dale, Pa. April 24, 1923. Filed Jan. 26, 1920; serial No. 353,940.

Publications Received

The Engineering Foundation, Engineering Societies Building, New York City. Report for the year ended Feb. 8, 1923. Publication No. 6. Pp. 118; 7x10 in.; illus.

Interim Report of the Dominion Fuel Board, Ottawa, Canada. Pp. 25; 6x9 in. Accompanying the report are two maps showing coal fields, estimated reserves and freight rates, origin of coal supply, location of peat bogs and distribution of fuel woods. Included are three charts are giving the annual consumption of coal in Canada from 1901 to 1921, the coal supply by provinces, covering output, distribution, sources and consumption.

Production of Explosives in the United States during the calendar year 1922, by W. W. Adams, Bureau of Mines, Washington, D. C. Tech. paper 340. Pp. 25; 6x9 in.; tables.

Coal-Mine Fatalities in the United States, 1922, by W. W. Adams, Bureau of Mines, Washington, D. C. Tech. paper 339. Pp. 97; 6x9 in.; tables.

The General Electric Co., Schenectady, N. Y., has issued a 34-page booklet to its stockholders covering thirty years' history of its activities. The book is well illustrated, including pictures of some early inventions as well as some of the present day.

Exide Ironclad Batteries for Storage Battery Locomotive. The Electric Storage Battery Co., Philadelphia, Pa. Bulletin No. 195, superseding Bulletin No. 146. Pp. 19; 8x10 in.; illus.

Splices and Tapes. The Okonite Co., Passaic, N. J. Pp. 8; 6x9 in. Describes the importance of, with instructions for making, a perfect splice, and tells of the important properties of tape and how to recognize these properties.

Multistage Series Pumps. De Laval Turbine Co., Trenton, N. J. Catalog H. Pp. 20; 8x11 in.; illus. Double suction impellers and volute diffusers are used in this pump, as in single-stage centrifugal pumps; the connecting passages from stage to stage being included in the pump case casting, as in the ordinary multistage pump. The pumps are made with two or three stages.

"Imperial" Type XPV Duplex Steam-Driven Air and Gas Compressors. Ingersoll-Rand Co., New York City. Pp. 35; 6x9 in.; illus. This compressor is built in a number of different types and sizes. Stress is laid on the steam valve gear and the automatic cutoff governor which regulates the compressor. Other features of design illustrated and described are the Ingersoll-Rand plate air valves, used for both intake and discharge; the unit construction, which requires a simple foundation; and the automatic flood system of lubrication.

The John Cramer Library. Twenty-eighth annual report for the year 1922. Pp. 31; 7x10 in.; tables.

American Mining Congress, Report of the Proceedings of the 25th annual convention at Cleveland, Ohio, Oct. 9-14, 1922. Pp. 776; 6x9 in.; illustrated.

Coke and By-Products in 1921, by R. S. McBride, U. S. Geological Survey, Washington, D. C. Pp. 444; 6x9 in.; illustrated. Contains statistics showing production, distribution and utilization of coke and by-products obtained from coke ovens in the United States in 1921, covering both bee-hive and byproduct coke.

Traffic News

Permission has been granted the **Hocking Valley Ry.** to obligate itself to pay \$5,098,000 for 2,000 70-ton steel hopper-bottom cars.

There are persistent rumors at Chattanooga, Tenn., that Henry Ford and George L. Carter, of Johnson City, Tenn., a financier, will construct a new coal line from the southern West Virginia coal fields through Bland, Wythe and Carroll counties, Virginia, and across North Carolina via Mount Airy to the coast. Reports are that the road is to connect with Mr. Ford's present line, serving his Kentucky coal fields.

The Rockdale, Sandow & Southern R.R. has applied to the Interstate Commerce Commission for authority to construct and operate a line of standard-gauge railroad from Marjorie, on the International Great Northern, to Sandow, twelve miles distant. It is stated that this line will open for immediate development approximately 1,000 acres of proven lignite. In that area the bed is said, in the application, to have an average thickness of 13 ft., providing a recoverable tonnage in excess of 13,000,000 in a territory remote from coal mines, in which the cost of fuel is excessively high. Beyond the proposed terminus of the road an additional 50,000,000 tons of lignite coal is recoverable, the applicant declares.

As the result of a comprehensive and extensive survey and investigation, the Baltimore & Ohio R.R. has announced its new car-rating figures and ratings for the various divisions reaching the coal fields of northern West Virginia, the result being a marked reduction in the aggregate ratings for many of the Baltimore & Ohio divisions. Ratings are made retroactive to July 16, according to the bulletin governing distribution just issued by the B. & O. On the new basis the Monongah Division will be entitled to 1,888 cars, the Connellsville Division to 985 cars, the Charleston Division to 252 cars, the Morgantown & Kingwood, Cumberland, Virginia Northern and Preston railways a combined rating of 236 cars.

H. A. Cochran was appointed coal traffic manager, of the Baltimore & Ohio R.R. Baltimore, Md., effective July 16. He takes the place of H. M. Matthews, who recently died.

The Reading R.R., has been authorized by the Interstate Commerce Commission to assume the obligation of the issuance of \$6,000,000 in equipment certificates to be expended in the purchase of new locomotives and cars. The new equipment includes 25 locomotives at \$38,192 each; 500 70-ton steel hopper coal cars at \$2,072.45 each; 500 70-ton steel hopper coal cars at \$2,135.37 each; 500 60-ton steel hopper coal cars at \$2,067.82 each; 500 70-ton steel hopper coal cars at \$2,075.58 each.

The Unadilla Valley Ry., has been authorized to issue notes to cover, among other things, a coal storage and locomotive fuel station at New Berlin at which engines are to be loaded by gravity, and ten 50-ton hopper coal cars to cost \$2,500 each.

The Interstate Commerce Commission has authorized the Chicago & Northwestern Ry. to assume obligation for \$4,755,000 of equipment certificates to be applied on the purchase of the following property: Forty Mikado-type freight locomotives at \$45,995.06 each; 10 Pacific-type passenger locomotives at \$43,200 each; 140 milk express cars at \$5,804.93 each; 800 50-ton steel ore cars at \$1,673.70; 800 50-ton steel underframe gondola cars at \$1,919.41 each; 200 50-ton steel underframe flat cars at \$1,581.10 each; 40 10,000-gallon steel tankers at \$2,550 each.

As the Interstate Commerce Commission refused to permit the Virginian Ry. to build a spur between Elmore and Mullins, for a distance of about a mile and a quarter down the Guyan River, in order to permit the Pocahontas Fuel Co. to open a new mine, it is now stated that the coal company will build the spur on its own responsibility. Pending such construction, the Virginian will demand a rehearing on

this application and if that is denied then an appeal will be taken to the federal courts, the appeal to be based on the contention that the interstate commerce commission has gone beyond the authority vested in it by law.

Earnings of coal roads cut last year at this time on account of the coal strike, snapped back to normal in June with a substantial net income as against a deficit last year. The Lehigh Valley reported net operating income for June amounting to \$1,012,023, against a deficit of \$32,044 last year. June gross was \$7,052,888, against \$4,694,664, and the balance after taxes was \$1,054,963, against \$20,154. Six months' gross was \$36,280,628, against \$31,017,207, while balance after taxes was \$897,100, against \$2,049,260, and net operating income \$631,720, against \$1,802,808 for the same period last year. The Delaware & Hudson Co. for June showed net operating income of \$1,155,890, against a deficit of \$292,905 last year. Gross was \$4,454,187, against \$2,297,070, and balance after taxes \$1,197,051, against a deficit of \$261,398. For the six months ended June 30 last gross was \$22,961,570, against \$18,866,476; balance after taxes \$2,789,696, against \$1,467,639, and net operating income \$2,510,575, against \$1,494,268 for the same period of the previous year. The Philadelphia & Reading showed a net operating income of \$2,544,385, against \$123,507 last year. Gross was \$8,959,203, against \$5,673,491, and balance after taxes \$2,681,006, against \$382,957. Six months' gross was \$55,077,844, against \$38,260,119; balance after taxes \$17,192,283, against \$6,970,448, and net operating income \$15,938,308, against \$5,582,788. The report of the Norfolk & Western showed net operating income for June amounting to \$1,587,249, against \$3,403,803 last year. Gross was \$7,881,048, against \$9,478,091, and balance after taxes \$1,304,034, against \$3,259,622. Six months' gross was \$44,938,946, against \$46,011,351; balance after taxes, \$6,814,339, against \$12,271,486, and net operating income \$8,892,633, against \$13,574,542 for the corresponding period of 1922.

Coming Meetings

The tenth annual **Tennessee First-Aid Contest and Miners' Field Day** will be held at Knoxville, Tenn., Aug. 4, in the Knox County Court Yard, under the auspices of the Tennessee coal operators, state mine inspectors and the U. S. Bureau of Mines. R. E. Howe, secretary of the Southern Appalachian Coal Operators Association, secretary-treasurer. J. M. Webb, of the U. S. Bureau of Mines, is instructing the first-aid teams.

The **American Institute of Mining and Metallurgical Engineers** will hold its annual meeting in Canada. The meeting will start Aug. 20 at Toronto and end Aug. 30 at Montreal. Secretary F. F. Sharpless, 29 West 39th Street, New York City.

Rocky Mountain Coal Mining Institute will hold its summer meeting Aug. 27 to 29 at Salt Lake City, Utah, in conjunction with the **International Safety and First-Aid Meet.** Secretary, Benedict Shubart, Denver, Colo.

New York State Coal Merchants' Association will hold its annual convention on Sept. 10-12 at Sacandaga Park, N. Y. Executive secretary, G. W. F. Woodside, 250 Arkay Building, Albany, N. Y.

Oklahoma Coal Operators' Association will hold its annual meeting Sept. 13 at McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

The **American Mining Congress** will hold its twenty-sixth annual convention in conjunction with the **National Exposition of Mines and Mining Equipment**, Sept. 24-29, at the Milwaukee Auditorium, Milwaukee, Wis. Secretary, J. F. Callbreath, Washington, D. C.

National Safety Council will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

The **West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers** will hold its annual meeting Oct. 19-20 at Huntington, W. Va. Secretary-treasurer, Herbert Smith, Robson-Prichard Bldg., Huntington, W. Va.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.